

REFINEMENT OF THE AIR FORCE SYSTEMS COMMAND

PRODUCTION RATE MODEL

THESIS

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AFIT/GCA/LSQ/89S-1

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REFINEMENT OF THE AIR FORCE SYSTEMS COMMAND PRODUCTION RATE MODEL

THESIS

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

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Master of Science in Cost Analysis

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Preface

The purpose of this study was to refine the Air Force Systems

Command (AFSC) Production Rate Model that was developed in 1984 by The

Analytic Sciences Corporation (TASC). The research analyzed several new

alternative model formulations in an effort to derive better weapon

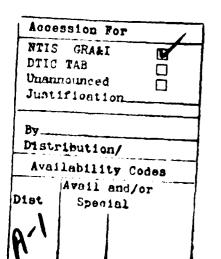
system production estimates.

My interest in this area goes back to my experiences as a weapon systems cost analyst, often wondering about the accuracy of my estimates in light of constant production rate changes and tradeoff analyses.

This thesis is a result of my efforts to perhaps build upon a concept I wish I had found out about earlier in my career.

I am deeply indebted to my faculty advisor, Mr. Richard L. Murphy. His patience and understanding in support of my efforts are deeply appreciated. Without his knowledgeable explanations of the production rate modeling issue, statistical analysis techniques, and SAS programming, I would still be in the library or on the computer terminal.

Most importantly, I wish to thank my wife Vicki for a being a shoulder to lean on during my bouts with writer's cramp. Without her loving support and an occasional push in the back, my completion of this thesis would not have been possible.





Keith K. Agena, Captain, USAF

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Abstract

The purpose of this study was to refine the Air Force Systems

Command (AFSC) Production Rate Model that was developed in 1984 by The

Analytic Sciences Corporation (TASC). In 1985, under an AFSC sponsored

thesis, USAF Captain Hugh Bolton addressed various shortcomings in the

TASC formulation. Bolton also investigated two alternative formulations

and discovered that both models provided better estimates overall than

the basic learning curve model and the TASC formulation. Further

evaluation of the characteristics of these two alternatives was,

however, beyond the scope of his research.

The current effort analyzed several modifications to Bolton's original alternatives in an effort to derive better results. To accomplish this, four research objectives were established.

- The first objective was to develop alternative formulations by expanding and/or altering TASC's and Bolton's formulations. These models should preserve the logic of the original formulations.
- The second objective was to compare the results between TASC'S and Bolton's model formulations and the new alternative model formulations to determine which alternatives performed better and under what circumstances.
- The third objective was: (1) to investigate if statistical relationships exist for individual variables, (2) to determine which variables appear significant for different weapon systems, and (3) to identify any patterns that may exist in the occurrence of those variables.

The research was successful in evaluating these objectives. The modified formulations developed in this research effort outperformed the existing TASC and Bolton formulations. It was recommended that AFSC incorporate the new modified formulations into its Production Rate Model.

REFINEMENT OF THE AIR FORCE SYSTEMS COMMAND PRODUCTION RATE MODEL

I. Introduction

The goal of this thesis is to refine the Air Force Systems Command (AFSC) Production Rate Model by evaluating new formulations of the model in an attempt to improve on the existing formulation. If no one formulation provides consistently better estimates across all weapon systems, the thesis will also attempt to identify the conditions under which a competing alternative outperforms its competitors. Successful accomplishment of these objectives should enhance the ability of the AFSC Production Rate Model to predict weapon system production costs.

General Issue

Many of the "most serious and vexing problems in the Department of Defense's (DOD) ability to purchase weapon systems are the consequence of a mismatch between the needs of today's defense buyers and an obsolescent production culture" (5:11). It is very unusual for today's weapon systems to display a stable production rate in the midst of constant trade-offs between congressional pressures, affordable program budgets and technological innovations (5:11).

While the DOD seeks to develop and update defense systems which embody superior technology to respond to new threats, investment and support costs must remain affordable. Weapon system costs are difficult to control, however, when Congress and the DOD requires the flexibility

to change production rates and the size of annual buys yearly and more often. (5:11)

As a direct consequence, the procurement environment in which the DOD bases its decisions is very different from earlier decades when weapon system unit costs were lower and designs were simpler. The quantity of weapons system purchases vary annually in response to fluctuations in the Defense budget due to changing national objectives. Therefore, in response to control the defense budget, Congress or the DOD frequently change the programmed buy schedules during the "planning years before the contracts are let or subsequently during the lifetime of the production contracts" (5:11).

Unfortunately, fluctuating annual production quantities translate to inefficient production rates which do not allow defense contractors to produce at maximum efficiency. According to Captain Hugh Bolton, a way to achieve some measure of cost stability is to produce weapon systems at efficient and economic production rates. He cites Mr. David Acker's belief that "producing a defense system at an economic production rate can provide a financial savings, decrease the production time for the system, and decrease the time to complete deployment of the system." (3:2)

Presently, Department of Defense cost analysts use "learning curve" equations to develop weapon system production estimates in this dynamic acquisition environment. Unfortunately, the analysts' ability to accurately estimate the true cost of fluctuating programs is hampered by the learning curve's insensitivity to trade-off decisions (16:213). The real limitation of the basic learning curve is its inability to model

production policy changes that influence production rate (16:213). This means that when production policies are subject to frequent change, the basic learning curve may not provide the best predictions.

The production rate of today's and tomorrow's weapons systems no longer display an even production rate over time. Instead, production rates are "typically ragged, rising or falling sharply in response to changing perceptions of need" rather than "rising smoothly to full rate, remaining there for a number of years, and then gracefully phasing down" (5:11). This hampers the cost analyst's ability to reliably estimate weapon system production costs.

Womer notes that:

Congressional concern and the need for better planning capabilities provide the impetus for new research in this area. The approach favored by the Department of Defense is one of estimating parametric cost equations which attempt to model cost as a function of only a few aircraft design and performance characteristics. These models often yield useful planning estimates, but Large and Gillespie show that the models may produce estimates that can be off by as much as 100 percent. The real limitation of these models is their inability to consider production policy changes which may occur prior to or during the life of a program. (16:213)

Therefore, refinement of the learning curve equation must be accomplished to capture the effects of an inconsistent procurement policy that influence production rate. As Bolton states, DOD decision makers need an analytical tool which allows them to perform tradeoffs quickly and accurately. The tools "must measure the cost impact of program schedule changes which equate directly to increases or decreases in annual production rates" to develop more accurate cost estimates.

(3:2)

Specific Issue

The Air Force Systems Command Production Rate Model was developed by The Analytic Sciences Corporation (TASC) as an estimating tool for generating rough order of magnitude estimates among various production schedules for different weapon systems. The TASC model attempted to address the basic unit learning curve's inability to capture the effects of production rate changes. Bolton's thesis evaluated this model and determined that it was appropriate for its original purpose of generating budgetary estimates. However, refinements were required to address potentially erroneous assumptions made by the model prior to its use as a valid estimating tool. (3:43-44)

Bolton further showed that two alternative models he developed with the assistance of Mr. Richard L. Murphy, Assistant Professor of Quantitative Management Techniques at the Air Force Institute of Technology, gave better overall results than the basic learning curve equation and the TASC model formulation used in the Production Rate Model. A discussion of Bolton's alternative formulations will be covered in the literature review. Also, there was some evidence that one alternative provided more accurate estimates for certain types of weapon system programs. An invest ation for the possible explanation of this finding was, however, beyond the scope of the intended research. (3:44)

Therefore, this thes!s attempts to refine the AFSC Production Rate Model by investigating alternative model formulations which might better represent the cost/quantity/rate relationships described by TASC.

Research Objectives

In order to logically investigate the specific issue, the following research objectives have been established:

- A. The first objective is to develop alternative formulations by expanding and/or altering TASC's and Bolton's formulations. These models should preserve the logic of the original formulations.
- B. The second objective is to compare the results between TASC'S and Bolton's model formulations and the new alternative model formulations to determine which alternatives performed better and under what circumstances.
- C. The third objective is: (1) to investigate if statistical relationships exist for individual variables, (2) to determine which variables appear significant for different weapon systems, and (3) to identify any patterns that may exist in the occurrence of those variables.

Scope of the Research

The scope of this research is limited to the evaluation of alternative models that have the same basic form as the TASC model or Bolton's quadratic formulations. The new alternatives differ in that they incorporate different sets of variables into the existing equation's structure. References made to other research in the production rate area provides a background upon which this research can be evaluated.

The findings of this thesis are based on the TASC data set provided in the TASC Production Rate Model Report (15). The data set includes

the recurring unit cost of various weapon systems adjusted for inflation. The process of eliminating the effects of inflation will normally introduce some measurement error into the data. Furthermore, the methodology employed by TASC to convert the Then-Year dollar budgetary estimates to constant Base-Year 1984 dollar estimates is not provided in the TASC documentation and therefore, could not be evaluated.

Finally, a cursory understanding of non-linear regression techniques and integral calculus is required to understand the derivation and solution of the various formulations. A formal treatment of these two subjects is not provided in this thesis. The explanation of basic concepts used in developing the results are provided at an overview level. References are provided which detail the in-depth treatment required to solve for the various alternative formulations.

II. Literature Review

Background

Various authors have sometimes referred to the learning curve and related concepts by other names such as the progress curve, the improvement curve, and the experience curve (18:303). The term learning curve will be used in this section.

First documented by T. P. Wright in 1936 (17:122-128), the learning curve suggests that as the quantity of units manufactured doubles, the number of direct labor hours it takes to produce an individual unit decreases at a constant percentage or uniform rate. (18:302)

Academicians and practitioners have developed numerous variations of the curve since then; however, the log-linear form of the unit learning curve remains as the most common type used by government and industry (1:Chap 7,8-10).

The equation of the unit learning curve formulation is:

$$Z = A * X^b * E \tag{1}$$

vhere

Z = Direct labor hours to produce the Xth unit

A = Theoretical first unit cost parameter

x = The sequential unit number or Xth unit

b = Parameter related to the rate of learning

E = Error term

The unit learning curve slope is expressed in terms of a doubling of quantity. The rate parameter b can be expressed as:

$$b = \ln s / \ln 2 \tag{2}$$

where s = slope of the learning curve. For example, a unit curve having a slope of .80, or 80%, will have a learning curve parameter of

in(.80)/in 2 = -.223144/.693147 = -0.321928. An 80% learning curve
slope means that unit 2 will cost 80 percent of unit 1, unit 4 will cost
80 percent of unit 2, unit 42 will cost 80 percent of unit 21, and so on
for any doubling of units. (3:10)

According to Bolton, "it is fairly well accepted within the Defense Department that varying the rate at which a manufacturer produces a product will have an impact on the per unit cost" (3:3). The primary factor which impacts unit costs is the relationship between the production rate and the production capacity of the manufacturer. This relationship also depends on the ability of the manufacturer to change his existing production capability through significant capital investments in anticipation of expected production quantities. (3:4)

Unfortunately, the basic learning curve formulation does not capture the effects of either of these two production factors. Numerous formulations to account for the cost impact of production rate, however, have been proposed over the last two decades.

According to Lt Col William Cheney, Orsini (1970) experimented with the incorporation of production rate as both an additive and multiplicative term in addition to the basic unit learning curve equation and reportedly obtained better statistical results than with the basic unit curve. Fazio and Russell (1974) and Large et al. (1974) found, however, that the influence of production rate on cost cannot be predicted with confidence and that each case must be examined individually. Cheney's own work showed that cumulative quantity, delivery lead time, and maximum delivery rate were highly significant variables. These variables had the greatest explanatory effect in a

step-wise linear regression analysis he conducted in an effort to identify production parameter variables which reduced the standard error of the estimate. (4:73,173-179)

Dr. Larry L. Smith (1976) and John C. Bemis (1981) incorporated a parameter for production rate directly into the unit curve formulation. The formulation was:

$$Z = A * X^b * Y^C$$
 (3)

where

Y = Production rate

c = Parameter related to the rate of production

Z,A,X = As defined in equation 1.

Although the model fit some data sets rather well, there were several problems with using this log-linear based approach involving multicollinearity and the use of estimated lot plot points. (3:14-16)

Robert M. Berg, Richard L. Dennis, and James M. Jondrow (1986) suggested that the problems of estimating using the log-linear approach could be avoided by first converting equation 3 into an integral form. By setting the total cost of the lot equal to an integral with the first and last units of the lot as the bounds of integration, the total cost of the lot could then be solved through a complex iterative technique using non-linear regression. Using this technique, the residual sum of squares term was significantly reduced compared to the results obtained by the log-linear approach for the same data. A limitation of this approach, however, was that the properties of the estimators were unknown unless the size of the data set was large. (2:12-13)

The complex iterative technique used by Berg, Dennis, and Jondrow capitalized on the fact that non-linear regression models reduced the problem of multicollinearity in the variables (3:45). The technique

uses direct search methods to compute the model parameters. These include the Gauss-Newton method and the Marquardt algorithm (8:76-78). For a detailed explanation and demonstration of nonlinear regression techniques, refer to Gallant (7) (8), Neeley (11) and Neter (12).

TASC Model

The TASC model formulation is currently used in the Air Force

Systems Command Production Rate Model. In order to understand the TASC concept of how production rate affects the learning curve slope, it is important to understand the nature of long-run and short-run production cost curves.

Short-run Cost Curve. The short-run cost curve assumes that the plant and equipment available to a manufacturer is relatively fixed. There is an optimal rate of production at which unit costs will be at their minimum. If the production rate is either greater or less than this optimal rate, unit costs will increase. A manufacturer who produces at a rate other than the optimal rate is not being inefficient. He is merely operating at a production rate other than the optimal rate for which the plant and equipment were designed and as a result, incurs a higher production cost. Inefficient production/cost points lie above the short-run cost curve. (10)

Long-run Cost Curve. The long-run cost curve assumes that the manufacturer is able to change his plant and equipment to minimize his cost for an anticipated rate of production. In other words, for any given rate of production there exists a plant that is able to produce that output at the lowest unit cost. Furthermore, this plant will have

its own short-run cost curve. In fact, the surface of the long-run cost curve is generated by connecting the minimum cost points of all possible short run cost curves (9:191-192). Both the short and long-run cost curves have a shape similar to a "bathtub." For this reason, they are frequently referred to as bathtub curves. (10)

The shape of the long-run cost curve implies that there is one configuration of plant and equipment with an optimal rate of production that equates to the absolute minimum unit production costs (9:191-192). If minimizing unit production costs was the sole goal of an enterprise, this is the configuration and production rate they would select. However, for every possible production rate there is a plant configuration that minimizes unit production costs (9:199-201). The particular configuration of plant and equipment selected by a manufacturer depends on his perception of what the production rate will be over the long-run curve (9:191-192). Unfortunately, a manufacturer cannot make large scale changes to this plant and equipment to accommodate short-run fluctuations in production rates. This means that when short-run fluctuations in production rates occur, manufacturers will frequently find themselves producing at other than the optimal rate of production regardless of the particular configuration of plant and equipment they select. (10)

Figure 1 is a graphic representation of the bathtub curve effect that shows various short-run curves for plants of varying sizes, levels of facility capability, capital investment, manpower availability and anticipated production output as specified by the government for a typical weapon system program. (14:8-10)

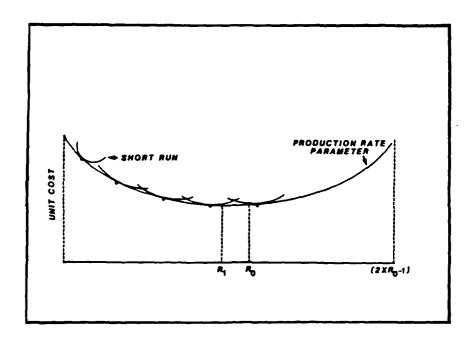


Figure 1. "Bathtub" Shaped Average Cost Curve (14:8)

short run cost curves. TASC seems to assume that all long run adjustments are made prior to and in anticipation of expected procurements. Production begins with a plant and equipment that has been configured for a particular procurement quantity. Furthermore, TASC assumes that each manufacturer equates his optimal rate of production to the maximum planned rate of production. Finally, TASC seems to assume that once a production decision is made, further adjustments are no longer possible. Their concept of the relationship between unit costs and production rates is a short run concept where the existing plant and equipment is always optimized for the maximum planned production rate. As a result of these assumptions, all actual production rates are either at or below the optimal production rates tend

to be less than planned production rates, manufacturers that behave according to the TASC assumptions would never produce at rates greater than the optimum rate. (10)

In addition, TASC assumes that the short run curve is symmetrical about the optimal rate of production (R_0) (3:18-19). Equal deviations in production below and above R_0 have the same cost impact. Since TASC assumes that actual production rates are always less than optimal rates, this assumption of symmetry has no impact on the methodology used to estimate the parameters of their model. However, the assumption is necessary if the model is to be used to estimate production costs for production rates above R_0 . (10)

A graphic representation of the intended concept is provided in Figure 2. The unit cost and cumulative quantity plane represents the basic learning curve as presented in equation 1. The inclusion of the production rate plane represents incorporation of the production rate parameter (Y). As the cumulative quantity doubles, unit costs decrease at some constant percentage as long as the production rate remains constant. Equation 3 says that unit costs increase whenever the production rate deviates from the optimal production rate. This behavior is reflected by the parabola which rises from the optimal production rate. Therefore, a manufacturer could incur an increase in unit costs even though he has increased the cumulative quantity produced. The surface initialization point (SIP) is similar in concept to the typical first unit cost or "A" in the basic learning curve equation (14:12). The difference is that the SIP assumes a different value depending upon the slope of the production rate curve (14:12).

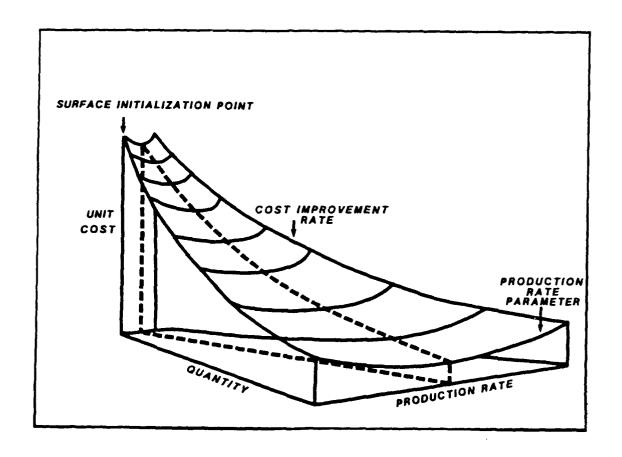


Figure 2. The $Z = A*x^b*y^c$ Model Formulation (14:2)

According to Murphy, the TASC equation is not capable of producing the relationship depicted in Figure 2. A particular weakness of the model is that it will not provide an empirical determination of the value of R_0 . This is undoubtedly the motivation behind the assumptions made by TASC to justify their model formulation. (10)

In conclusion, even though the TASC model is based on some very constraining and questionable assumptions, it still serves as the basis for the Production Rate Model.

TASC Formulation. The TASC formulation is the same as Smith's equation (3). The difference is that TASC uses the non-linear method to calculate the model parameters. The model formulation is:

$$Z = A * X^b * Y^C$$
 (4)

where

Z = Cost of unit X

A = Surface Initialization Point related to the first unit cost

X = Cumulative quantity

b = Unknown parameter related to the rate of learning

Y = Production rate (Annual Buy schedules serve as a proxy)

c = Unknown parameter related to the rate of production

Source: (3:14)

TASC solves this equation by first estimating the total cost for each lot by integrating over the total number of units as shown:

$$TC_{i}' = \int AX^{b}Y_{i}^{C} dX = \{A/(b+1)\}\{Xu_{i}^{(b+1)} - Xl_{i}^{(b+1)}\}\{Y_{i}^{C}\}$$

$$Xl_{i}$$
(5)

where

TC_i' = Estimated total cost of lot i

= Production rate for lot i

XI_i = Cumulative quantity through lot i-1
Xu_i = Cumulative quantity through lot i
A = Surface Initialization point related to the first unit cost

b = Unknown parameter related to the rate of learning

c = Unknown parameter related to the production rate

Source: (3:18-20)

The TC, Y, Xl and Xu variables are already known for each lot. The SAS procedure then solves for the unknown parameters A, b, and c using the Marquardt algorithm. The SAS programs used to solve TASC's model and the following alternative models are outlined in Appendix C of Bolton's thesis (3:C1-C6).

Bolton's Alternative One Formulation

Bolton's first alternative formulation (Alt 1) adds an additional variable to the TASC model formulation. The variable captures the effect of a change in production rate from one lot to the next. Bolton states that this variable is as important in explaining the cost impact of production rate as the production rate itself (3:26). He feels that when the production rate moves from a low rate to a high rate or from a high rate to a low rate, it has an impact "on the efficiency of the production process which would not be captured by looking at production rate alone" (3:26).

According to Bolton, this formulation reverts back to the TASC form if the production rate between lots is stable. The drawback is that this model is based on the same set of assumptions logic as the TASC formulations and subject to the same criticism. (3:38)

The alternative one formulation is shown below.

$$Z = A * X^b * Y^C * R^d$$
 (6)

vhere

R = Ratio of the rate in lot i to the rate in lot i-1

d = Unknown production ratio parameter

X,Y = Variables as defined in equation 4.

A,b,c = Unknown model parameters as defined in equation 4.

Bolton uses the TASC approach to solve this model. He solves this model by converting equation 6 from a formulation that reflects unit cost to one that reflects total cost. He sets the total cost of the lot (TC) equal to an integral form and solves for this value over the upper and lower bounds of integration by the number of units as shown on the following page:

$$TC_{i} = \int_{A}^{Xu_{i}} Ax^{b} Y_{i}^{c} R_{i}^{d} dX = \{A/(b+1)\} \{Xu_{i}^{(b+1)} - Xl_{i}^{(b+1)}\} \{Y_{i}^{c} R_{i}^{d}\}$$

$$Xl_{i}$$
(7)

where the variables and unknown parameters are as defined in equations 4 and 5. The SAS non-linear regression procedure then solves for the model parameters using the Marquardt algorithm. (3:18-20,26)

Bolton's Alternative Two Formulation

Bolton's Alternative Two (Alt 2) was formulated to solve directly for the optimal rate of production. As noted earlier, TASC's formulation models only the left hand side of the parabola in Figure 1. Bolton overcomes this deficiency by including a quadratic function expressed as a function of the production rate (Y) to solve directly for R_0 's optimal value. (3:26)

The alternative two formulation is shown below:

$$Z = A * \chi(b + c*Y + d*Y^2)$$
(8)

vhere

b,c,d = Quadratic model parameters (d>0)

X,Y = Variables as defined in equation 4.

A = Unknown parameter as defined in equation 4.

The quadratic model parameters solve directly for the optimal rate of production. The constraint that "d" must be positive is necessary for this quadratic to have a minimum. Notice that the parameters b,c, and d are associated with different terms in this equation than in previous equations. As before, Bolton solves this model by first integrating the total cost of the lot by the number of units as shown on the following page:

$$TC_{i}' = \int_{AX}^{Xu_{i}} dx$$

$$Xl_{i}$$

 $TC_i' = A/(b+cY_i + dY_i^2 + 1)\{Xu_i(b+cY_i+dY_i^2+1) - Xl_i(b+cY_i+dY_i^2+1)\}$ (9) where the unknown parameters b,c,d are defined in equation 8 and the remaining variables and parameter A are as defined in equations 4 and 5. (3:39)

According to Bolton, as long as the parameter value associated with the quadratic term is significant, "the formulation will produce an optimum production rate, R_0 , at which unit costs will decline along the steepest possible learning curve slope" (3:27). If the production rate changes from R_0 in either direction, "the slope of the learning curve becomes less steep, which means a slower rate of learning" (3:27). If the parameters c and d are not statistically significant, the formulation reverts back to the standard unit learning curve formulation (3:26-27,40).

Conclusion

Bolton concluded that based on a residual sum of squares comparison for each weapon system, both the Alt 1 and Alt 2 model formulations consistently provided more accurate estimates than both the basic unit learning curve equation and the TASC formulation. In addition, although Alt 1 provided better results than Alt 2 on an overall basis, the results suggested that Alt 2 provided more accurate estimates than Alt 1

for certain types of weapon systems. This assertion was not investigated, however, as it was beyond the scope of his research. (3:43-44)

Bolton's final recommendation was that Air Force Systems Command adopt Alt 1 as the new production rate model formulation based on its overall performance in reducing the residual sum of squares error term.

(3:44)

III. Methodology

Research Objective One

- The first objective is to develop alternative formulations by expanding and/or altering TASC's and Bolton's formulations. These models should preserve the logic of the original formulations.

Background. Bolton's alternative formulations identified two variables to account for the variations in production rate. These were defined as production rate (Y) and ratio of the production rate from lot i to lot i-1 (R). Since the scope of this research is limited to an analysis of variables or equation structures that Bolton had previously identified, no new variables will be introduced in this research. Therefore, the goal of this objective is to modify either the TASC formulation or the existing Bolton formulations in an effort to find alternative formulations. (3:26-27)

<u>Procedure</u>. First, the TASC formulation was expanded to incorporate the ratio (R) variable as a quadratic exponent of the production rate. It was envisioned that inclusion of the ratio variable as a quadratic exponent would capture the effect of changing rates of production and lead to calculation of the optimal ratio of production. This expanded formulation was called Modified Alternative One (Mod Alt 1). The expanded model is presented below:

Modified Alternative One:

$$Z = A * X^b * Y^{(c + dR + eR^2)}$$
(10)

vhere

Z = Cost of unit X

A = Surface Initialization Point related to the first unit cost

X = Cumulative quantity

b = Unknown parameter related to the rate of learning

Y = Production rate (Annual Buy schedules serve as a proxy)

R = (Ratio of the rate in lot i to the rate in lot i-1)
c,d,e = Unknown quadratic parameters related to R

Second, Bolton's Alt 2 was modified by expanding the exponent of X to include the production ratio (M) as a quadratic function in addition to the production rate variable (Y). This allowed for calculation of both the optimal rate of production and the optimal ratio of production. By setting M equal to the ratio of production (R) minus one, the equation reverts to Bolton's Alt 2 when the production rate is stable. For example, in the event that there is no change from lot i to lot i-1, the value for R is one. The production ratio equals zero (M = 1 minus 1), the quadratic function for production ratio drops out, and the equation reverts back to Bolton's Alt 2. This alternative formulation was called Modified Alternative Two (Mod Alt 2). The expanded model is presented below:

Modified Alternative Two:

$$Z = A * X(b + cY + dY^2 + eM + fM^2)$$
 (11)

where

Z = Cost of unit X

A = Surface Initialization Point related to the first unit cost

X = Cumulative quantity

Y = Production rate (Annual Buy schedules serve as a proxy)

M = (Ratio of the rate in lot i to the rate in lot i-1) - 1

b,c,d,e,f = Unknown quadratic parameters related to Y and R

Bolton's Alt 2 expressed the exponent of X as a quadratic function of the production rate (Y). Mod Alt 2 expresses the exponent of X as a quadratic function of both the production rate (R) and the production ratio (M). A final alternative model was formulated by expressing the exponent of X as a quadratic function of the production ratio (R) only without reference to the production rate. This model assumes that

changes cost are affected by changes in the rate of production and not the level of production. This alternative formulation was called Modified Alternative Three (Mod Alt 3). The expanded model is presented below:

Modified Alternative Three:

$$Z = A * \chi(b + cR + dR^2)$$
 (12)

vhere

Z = Cost of unit X

A = Surface Initialization Point related to the first unit cost

X = Cumulative quantity

R = (Ratio of the rate in lot i to the rate in lot i-1)

b,c,d = Unknown quadratic parameters related to R

In conclusion, three modified formulations were identified as potential candidates for evaluation and comparison against the TASC and Bolton formulations. The methodology for calculating and analyzing the modified formulations are discussed in the next section.

Research Objective Two

- The second objective is to compare the results between TASC'S and Bolton's model formulations and the new alternative model formulations to determine which alternatives performed better and under what circumstances.

<u>Background</u>. A drawback to using non-linear regression is that methods of analyzing the model are limited to that of comparison. In non-linear regression, the usual tests such as the F-ratio and t-test are not appropriate indicators of model fit and specification. Although these test statistics may be calculated, exact conclusions for specification and fit at any level cannot be drawn due to violations of assumptions usually made in linear regression about the normal distribution of the parameter values. Because the nature of the

parameter distributions in non-linear regression may not be assumed to be normal, the inferences made from the test statistics are not valid. (6:484)

In view of this fact, the only valid criteria for comparison among the selected "modified" alternatives in comparison to Bolton's alternatives is the residual sum of squares term for each weapon system on a case-by-case basis. The residual sum of squares is a term that measures the observed vertical deviation of the dependent variable from the fitted regression line (12:44). Since this vertical deviation represents the error in the estimate when compared to actual costs, a measure of comparison based on these vertical deviations seems reasonable.

Procedure. First, a SAS non-linear regression program was written for the basic learning curve equation in equation 1. The results from the non-linear regression of this equation could then be directly compared against the modified equations. In Bolton's thesis, the non-linear alternative results were compared against the linear results of the basic learning curve. This comparison was not an equivalent one as the effects of the log-linear transformation of the basic learning curve showed up in the residual sum of squares results.

Second, SAS non-linear regression programs for each of the selected "modified" alternatives were developed and regressed against the entire TASC data set.

Third, the results for each modified alternative were tabulated and compared to the TASC, Basic Learning Curve and original Bolton formulations. If a modified alternative consistently yielded the lowest

sum of squared residuals value for each of the weapon systems, then that alternative was considered the superior technique and recommended for immediate incorporation into the AFSC Production Rate Model. If the analysis showed no one alternative to be superior, then the circumstances under which each alternative appeared to perform best were considered and general guidelines for their use were suggested. If none of the modified formulations produced better results, then Bolton's recommendation was left unchanged.

Research Objective Three

- The third objective is: (1) to investigate if statistical relationships exist for individual variables, (2) to determine which variables appear significant for different weapon systems, and (3) to identify any patterns that may exist in the occurrence of those variables.

<u>Background</u>. Non-linear regression does not allow for testing the statistical significance of individual variables except as an asymptotic property. Therefore, even when the reduction in the sum of squares seemed to strongly indicate that one formulation is more significant than another, the significance or insignificance of individual variables in the equation remained an unresolved issue.

<u>Procedure</u>. First, Bolton's alternative formulations and the three modified alternatives were transformed from their non-linear form into their log-linear components. This transformation permitted use of the SAS stepwise regression procedure to identify the most significant variables within each modified formulation. The transformed models are shown on the next page:

Alt 1:

$$\ln Z = \ln A + b*(\ln X) + c*(\ln Y) + d*(\ln R)$$
 (13)

where the variables are as defined in equation 6.

Alt 2:

$$\ln Z = \ln A + b*(\ln X) + c*Y*(\ln X) + d*Y^{2}*(\ln X)$$
 (14)

where the variables are as defined in equation 8.

Modified Alt 1:

$$\ln Z = \ln A + b*(\ln X) + c*(\ln Y) + d*R*(\ln Y) + e*R2*(\ln Y)$$
 (15)
where the variables are as defined in equation 10.

Modified Alt 2:

$$\ln Z = \ln A + b*(\ln X) + c*Y*(\ln X) + d*Y^2*(\ln X) + e*R*(\ln X) + f*R^2*(\ln X)$$
 (16)

where the variables are as defined in equation 11.

Modified Alt 3:

$$\ln Z = \ln A + B*(\ln X) + c*R*(\ln X) + D*R^2*(\ln X)$$
 (17)
where the variables are as defined in equation 12.

In order to correctly perform the stepwise regression, Z had to be redefined to represent the lot average cost since the TASC data set does not contain unit values. This meant that X had to be defined to represent the unit that cost the same as the average cost for the lot. Unfortunately, X cannot be determined without knowing the slope of the learning curve. The solution was to use a rule of thumb to calculate the lot plot points. See the discussion in Appendix A for the calculation rules used to compute the rule of thumb plot points. Appendix B contains the SAS programs used in this analysis.

The results of the SAS stepwise regression runs were then analyzed to determine the frequency with which the variables appeared significant in each formulation. Both the variables and the parameter values were analyzed to determine whether or not a pattern existed within each weapon system type by model formulation.

IV. Findings

This chapter summarizes the results and analysis in the investigation of additional alternative formulations for the AFSC production rate model.

Research Objective One

- The first objective is to develop alternative formulations by expanding and/or altering TASC's and Bolton's formulations. These models should preserve the logic of the original formulations.

The three modified formulations were solved by first integrating the total cost of the lot i over the number of units in the lot and then creating SAS non-linear regression programs that used the Marquardt algorithm to solve for the unknown model parameters. The SAS programs are provided in Appendix B. The modified alternative formulations and the integration results are provided below:

Modified Alternative One:

$$Z = A * \chi^b * \chi^{(c + dR + eR^2)}$$
 (10)

The integration result was:

$$TC_{i'} = \int_{AX}^{Xu_{i}} dx$$

$$Xl_{i}$$

$$TC_{i}' = AY_{i}^{(c+dRi+eRi^{2})}/(b+1)[Xu_{i}^{(b+1)} - Xl_{i}^{(b+1)}]$$
 (18)

where the variables and unknown parameters are as defined in equation 10.

Modified Alternative Two:

$$Z = A * X^{(b + cY + dY^2 + eM + fM^2)}$$
 (11)

The integration result was:

$$TC_{i}' = \int_{AX}^{Xu_{i}} (b + cYi + dYi^{2} + eMi + fMi^{2})_{dx}$$

$$Xl_{i}$$

$$TC_{i}' = A/(b+cY_{i}+dY_{i}^{2}+eM_{i}+fM_{i}^{2}+1)\{Xu_{i}(b+cY_{i}+dY_{i}^{2}+eM_{i}+fM_{i}^{2}+1) - Xl_{i}(b+cY_{i}+dY_{i}^{2}+eM_{i}+fM_{i}^{2}+1)\}$$
 (19)

where the variables and unknown parameters are as defined in equation 11.

Modified Alternative Three:

$$Z = A * \chi(b + cR + dR^2)$$
 (12)

The integration result was:

$$TC_{i}' = \int_{AX}^{Xu_{i}} dx + cRi + dRi^{2}) dx$$

$$Xl_{i}$$

 $TC_i' = A/(b+cR_i+dR_i^2+1)[Xu_i(b+cR_i+dR_i^2+1) - Xl_i(b+cR_i+dR_i^2+1)]$ (20) where the variables and unknown quadratic parameters are as defined in equation 12.

Tables 1 through 5 provide the parameter estimates obtained by weapon system for each formulation. These tables are provided in the following pages:

TABLE 1
WEAPON SYSTEM PARAMETER COMPARISON
ALTERNATIVE 1

| TYPE | PROGRAM | <u>B</u> | Ç | ₫ |
|------------|------------------|--------------|------------------|--------|
| BOMBERS | B-1B | 1806 | 1507 | .0332 |
| | B-52 | 2067 | 0764 | 1161 |
| | B-58 | | N/A | |
| Fighters | A-10 | .0355 | 2467 | .0056 |
| | F-100 | 2024 | .0536 | 0573 |
| | F-101 | 2990 | .1312 | 0754 |
| | F-102 | 4562 | .1997 | 0492 |
| | F-106 | | N/A | 0100 |
| | F-15A/B | 1294 | .0151 | .0192 |
| | F-15C/D | 0807 | 3832 | .3985 |
| | F-15E | .0480 | 6597 | .2407 |
| | F-16A/B | 2159 | .0885 | .3464 |
| | F-16E | .0383 | 2735 -1.7352 | 1.2660 |
| ELECTRONIC | ARC-109V | 1.7835 | -1.7352 .1061 | 0408 |
| | ARC-54 | 1504 2226 | 2341 | .1081 |
| | asn-63 asn-70 | .0025 | 0421 | .0503 |
| | ASN-99 | .0339 | 3199 | .1800 |
| | ASN-108 | 2392 | .2790 | 1480 |
| | ASQ-133 | 1049 | 1204 | .0469 |
| | ASW-32 | .2965 | 5865 | .6544 |
| | CP-1035N | -,1233 | .2703 | 3533 |
| | JTIDS | 2056 | 0160 | 0590 |
| | LANT(NAV) | 1134 | 0061 | .0015 |
| | LANT(TAR) | 1050 | 0049 | .0023 |
| | LANT(REC) | 1434 | .0023 | 0028 |
| HELICOPTER | HH-52 | 3877 | 6510 | . 2866 |
| | CH-46 | 1202 | 2384 | 0105 |
| | H-53 | 1349 | 0003 | 0142 |
| | CH-47 | 0390 | 3183 | .0975 |
| | H-5 4 | 0569 | 2188 | .0107 |
| | HH-60D | 0543 | 0450 | 0125 |
| | SH-3 | 1706 | .0985 | .0255 |
| ARMAMENT | LLLGB | 1692 | 0042 | 0013 |
| | CEM | 3398 | .2121 | 1542 |
| _ | GBU-15 | 2477 | .5233 | 1385 |
| Missile | AMRAAM | 3439 | 0092 | 0257 |
| | HARM | 1851 | 0845 | 0229 |
| | IIR | 1486 | 1285 | 0497 |
| | AIM7F(R) | 3452 | 0895 | 0968 |
| | AIM7F(GD) | 4472 | .0217 | 0614 |

Source (3:D55-D74)

TABLE 2
WEAPON SYSTEM PARAMETER COMPARISON
ALTERNATIVE 2

| TYPE | PROCRAM | <u>B</u> | <u>c</u> | D |
|------------|------------------|----------------|--------------|---------------|
| BOMBERS | B-1B | 2347 | 0016 | .0000 |
| | B-52 | 0759 | 0019 | .0000 |
| | B-58 | 2.1100 | 0163 | .0029 |
| FIGHTERS | A-1 0 | .0969 | 0014 | .0000 |
| | F-100 | 0022 | 0005 | .0000 |
| | F-101 | 2622 | .0001 | 0000 |
| | F-102 | 4703 | .0005 | 0000 |
| | F-106 | 2431 | 0046 | .0000 |
| | F-15 A/ B | 1242 | 0008 | .0000 |
| | F-15C/D | .6322 | 0109 | .0000 |
| | F-15E | .3989 | 0083 | .0000 |
| | F-16A/B | 8475 | .0075 | 0000 |
| | F-16E | -1.8332 | .0199 | 0000 |
| ELECTRONIC | ARC-109V | .7989 | 0076 | .0000 |
| | ARC-54 | 1907 | .0001 | 0000 |
| | asn-63 | .1866 | 0001 | 0000 |
| | asn-70 | .0403 | 0004 | .0000 |
| | asn-99 | .1454 | 0003 | .0000 |
| | ASN-1 08 | .0545 | 0009 | .0000 |
| | ASQ-133 | 0719 | 0019 | .0000 |
| | asw-32 | 2392 | .0005 | .0000 |
| | CP-1035N | 3488 | .0115 | 0000 |
| | JTIDS | 0077 | 0052 | .0000 |
| | Lant (NAV) | 1091 | 0000 | .0000 |
| | LANT(TAR) | 1012 | 0000 | .0000 |
| | LANT(REC) | 2419 | .0021 | 0000 |
| HELICOPTER | HH-52 | .0522 | 0194 | .0006 |
| | CH-46 | 0967 | 0009 | .0000 |
| | H-53 | 1091 | 0007 | .0000 |
| | CH-47 | 0364 | 0015 | .0000 |
| | H-54 | 1021 | .0079 | 0002 |
| | HH-60D | 4634 | .0260 | ~.0004 |
| | SH-3 | 1386 | 0015 | .0000 |
| ARMAMENT | LLLGB | 1621 | 0000 | .0000 |
| | CEM | 2708 | .0000 | 0000 .0000 |
| MICCIE | GBU-15 | 1049 | 0003 0000 | .0000 |
| Missile | AMRAAM | 3450 - 1699 | 0000 | .0000 |
| | HARM | 1688 0977 | 0000 | .0000 |
| | IIR | 0977 3173 | 0000 | .0000 |
| | AIM7F(R) | | .0000 | 0000 |
| | AIM7F(GD) | 4571 | . UUUU | 0000 |

Source (3:D73-D95)

TABLE 3
WEAPON SYSTEM PARAMETER COMPARISON
MODIFIED ALTERNATIVE 1

| TYPE | PROGRAM | <u>B</u> | <u>c</u> | D | E |
|------------|------------------|--------------|-----------------|------------------|--------|
| BOMBERS | B-1B | 1207 | -1.2592 | .0172 | 0016 |
| | B-52 | 1979 | -1.0896 | 0093 | 0044 |
| | B-58 | 3797 | .4179 | 8730 | .2762 |
| FIGHTERS | A-10 | .0516 | -1.2789 | .0152 | 0023 |
| | F-100 | 3846 | 3478 | 2745 | .0109 |
| | F-101 | 2826 | .9207 | 1012 | .0227 |
| | F-102 | 5904 | 2580 | 0105 | 0039 |
| | F-106 | 5381 | 1000 | 2431 | .0406 |
| | F-15A/B | 1492 | 9314 | 0087 | .0019 |
| | F-15C/D | | -1.4984 | | 0319 |
| | F-15E | | N | I/A | |
| | F-16A/B | | N | /A | |
| | F-16E | | N | /A | |
| ELECTRONIC | ARC-109V | 5732 | 0544 N | 1365 | .0180 |
| | ARC-54 ASN-63 | | | .0865 | |
| | ASN-70 | | | .0092 | .0025 |
| | ASN-99 | .0102 | -1.6121 | .2108 | 0524 |
| | ASN-108 | 4176 | | 1278 | .0240 |
| | ASQ-133 | 0859 | -1.2165 | .0657 | 0128 |
| | ASW-32 | .8025 | -4.6111 | 1.8433 | 5587 |
| | CP-1035N | 1243 | | .0186 | 0295 |
| | JTIDS | | N | | |
| | LANT(NAV) | 1135 | -1.0013 | 0002 | .0001 |
| | LANT(TAR) | 1052 | 9969 | 0002 | .0000 |
| | LANT(REC) | 0880 | -1.2815 | .1382 | 0383 |
| HELICOPTER | HH-52 | 3644 | -1.7932 | .3831 | 1582 |
| | CH-46 | 1091 | -1.2527 | 0337 | .0121 |
| | H-53 | 1564 | 9879 | .0103 | 0008 |
| | CH-47 | 0467 | | .1115 | 0322 |
| | H-54 | 2368 | 5215 | 3659 | .0693 |
| | HH-60D | 2499 | 5810 -1.0530 | 1169 | .0112 |
| | SH-3 | | | .1097 | 0316 |
| ARMAMENT | ILLGB | | N N | /A | |
| | CEM | | | • | |
| WT GOTT P | GBU-15 | -•₹T03 | 6307 9827 | .0137 | 0040 |
| MISSILE | AMRAAM | | | | |
| | HARM | 1713 | N | .0035 | 001/ |
| | IIR | | -1.1410 | .0140 | _ 0069 |
| | AIM7F(R) | 32/1 4108 | -1.1410 | - 0117 - 0117 | .0020 |
| | aim7f(GD) | 4108 | -1.0000 | UII/ | .0020 |

TABLE 4
WEAPON SYSTEM PARAMETER COMPARISON
MODIFIED ALTERNATIVE 2

| TYPE | PROGRAM | B | <u>c</u> | <u>D</u> | Ē | <u>F</u> |
|---------------|------------------|---------|----------|-------------|-------|--------------|
| BOMBERS | B-1B | 2627 | ~.0067 | 0001 | .0003 | 0000 |
| | B-52 | 1422 | 0214 | .0040 | 0016 | .0000 |
| | B-58 | . 4285 | .0188 | .4028 | 0038 | 0003 |
| FIGHTERS | A-10 | .0649 | 0043 | .0004 | 0009 | .0000 |
| | F-100 | | ~~~~~~ | N/A | | |
| | F-101 | 1262 | .0033 | 0223 | 0018 | .0000 |
| | F-102 | | | N/A | | |
| | F-106 | .0833 | .0950 | .0260 | 0072 | .0000 |
| | F-15A/B | 1111 | .0057 | 0012 | 0010 | .0000 |
| | F-15C/D | .7189 | 0170 | .1002 | 0083 | .0000 |
| | F-15E | .3233 | .1000 | .0273 | .0004 | 0000 |
| | F-16 A/ B | | | N/A | | |
| | F-16E | -4.3335 | ~.1650 | .4009 | .0489 | 0001 |
| ELECTRONIC | ARC-109V | 1148 | 0278 | .0062 | 0000 | .0000 |
| | ARC-54 | | | N/A | | ~~~~ |
| | asn-63 | 2133 | .0285 | 0182 | 0003 | .0000 |
| | asn-70 | .0948 | .0232 | .0238 | 0002 | .0000 |
| | ASN-99 | .1820 | .0693 | 0363 | 0011 | .0000 |
| | ASN-108 | 1229 | 0226 | .0065 | 0000 | .0000 |
| | ASQ-133 | .0157 | .1149 | 0421 | .0000 | 0000 |
| | ASW-32 | 3.4025 | 1.6793 | -1.6572 | 0744 | .0004 |
| | CP-1035N | 1845 | .1531 | 2041 | .0052 | ~.0000 |
| | JTIDS | 3744 | 2036 | .2806 | .0014 | .0000 |
| | Lant(Nav) | 1365 | 0014 | .0004 | .0003 | ~.0000 |
| | LANT(TAR) | 2012 | 0047 | .0015 | .0014 | 0000 0000 |
| | LANT(REC) | 0435 | . 1438 | 0258 N/A | 0001 | 0000 |
| HELICOPTER | HH-52 CH-46 | 1623 | 0367 | 0074 | 0014 | .0000 |
| | H-53 | 0890 | .0223 | 0017 | 0035 | .0000 |
| | n-33 CH-47 | 0114 | .0248 | 0281 | 0017 | .0000 |
| | H-54 | 1152 | .0673 | 0295 | .0127 | 0005 |
| | HH-60D | 0214 | .0146 | 0026 | 0012 | ~.0000 |
| | SH-3 | 0557 | .0226 | 0025 | 0038 | .0000 |
| ARMAMENT | LLLGB | | | N/A | | |
| NO BEEN LOCAL | CEM | | | N/A | | |
| | GBU-15 | 0972 | .0159 | 0046 | 0002 | .0000 |
| MISSILE | AMRAAM | | | N/A | | |
| | HARM | | | N/A | | |
| | IIR | | | N/A | | |
| | AIM7F(R) | | | N/A | | |
| | AIM7F(GD) | | | N/A | | |

TABLE 5
WEAPON SYSTEM PARAMETER COMPARISON
MODIFIED ALTERNATIVE 3

| TYPE | PROGRAM | B | <u>c</u> | <u>D</u> |
|------------|-------------------|--------------|---------------|--------------|
| BOMBERS | B-1B | 3170 | .0100 | 0023 |
| | B-52 | 2192 | 0293 | .0014 |
| | B-58 | .1019 | 6367 | .2367 |
| FIGHTERS | A-10 | 0492 | 0731 | .0113 |
| | F-100 | 1103 | 1199 | .0047 |
| | F-101 | 2147 | 0764 | .0175 |
| | F-102 | 3859 | 0125 | .0034 |
| | F-106 | 3855 | 1277 | .0277 |
| | F-15A/B | 1321 | .0051 | 0005 |
| | F-15C/D | 2234 | .5284 | 2230 |
| | P-15 e | 5854 | .9111 | 3897 |
| | F-16A/B | 2748 | .0763 | 0035 |
| | F-16E | 2620 | .4134 | 1586 |
| ELECTRONIC | ARC-109V | .1184 | 0275 | .0105 |
| | ARC-54 | 1100 | .0032 | 0003 |
| | ASN-63 | .0110 | .0542 | 0237 |
| | ASN-70 | .0322 | .0003 | .0350 |
| | ASN-99 | 0524 | .0555 | 0044 |
| | ASN-108 | .0143 | 0341 | .0122 |
| | ASQ-133 | 1710 | .0144 | 0033 |
| | ASW-32 | 5831 | .6240 | 2020 0722 |
| | CP-1035N JTIDS | 1133 1878 | .1630 0266 | .0057 |
| | LANT(NAV) | 1133 | 0004 | .0001 |
| | LANT(TAR) | 1155 1050 | 0002 | .0000 |
| | LANT(REC) | 1481 | .0081 | 0025 |
| HELICOPTER | HH-52 | 3389 | .3010 | 1606 |
| hedior ied | CH-46 | 2009 | 1048 | 0074 |
| | H-53 | 1463 | .0022 | 0002 |
| | CH-47 | 1952 | .0334 | 0185 |
| | H-54 | 0427 | 1451 | .0270 |
| | HH-60D | 0652 | 0159 | .0013 |
| | SH-3 | 2225 | .0798 | 0227 |
| ARMAMENT | LLLGB | 1720 | .0011 | 0004 |
| | CEM | 1953 | .0042 | 0015 |
| | GBU-15 | 0477 | .0411 | 0069 |
| MISSILE | AMRAAM | 3430 | 0063 | .0007 |
| | HARM | 2195 | 0173 | .0029 |
| | IIR | 2178 | 0277 | .0044 |
| | AIM7F(R) | 3803 | 0075 | 0018 |
| | AIM7F(GD) | 4021 | 0157 | .0028 |

Research Objective Two

- The second objective is to compare the results between TASC'S and Bolton's model formulations and the new alternative model formulations to determine which alternatives performed better and under what circumstances.

The three modified formulations were compared with the TASC and Bolton formulations to determine the formulation which yielded the lowest residual sum of squares term. The results of each SAS non-linear regression computer run is summarized in Table 6, the Residual Sum of Squares Summary.

A brief explanation of the symbols used is presented here. The "*" indicates that no value was calculated for that weapon system using that alternative because of the inadequate number of observations in the data. The N/A indicates that no result was generated, either because the equation did not converge within 100 iterations or because the values calculated for a certain parameter or partial derivative in the equation exceeded the capacity of the SAS non-linear procedure. The bold italicized numbers for each weapon system indicates the lowest residual sum of squares value among the various formulations for that particular program. The LC column produces the results of the basic learning curve equation computed by the non-linear regression procedure in SAS.

Table 6 is presented on the following page. Note that the sum of squares results for the TASC, Alt 1 and Alt 2 values are from Table II in Bolton's thesis (5:41).

TABLE 6
RESIDUAL SUM OF SQUARES SUMMARY

| DDOCDAM | īC | TASC | ALT1 | ALT2 | MALT1 | MALT2 | MALT3 |
|--------------------|-----------|----------------------|----------------|------------|-------------|-------------|---------|
| PROGRAM BOMBERS | <u>LC</u> | IRSC | WUII | MLIZ | CHALL | PALIZ | IMUI 3 |
| B-1B | 18733 | 12451 | 10352 | 5950 | * | * | 11308 |
| B-52 | 2783352 | | _ | | 2212807 | | 2390182 |
| | 579983 | 483386 | 2323434 N/A | 2001233 | * | * | 2370102 |
| B-58 | 313303 | 402300 | N/A | - | • | • | |
| FIGHTERS | 42551 | 8904 | 8877 | 9102 | 8637 | 8685 | 18338 |
| A-10 | 43551 | | | 37852 | <i>0031</i> | N/A | 17252 |
| F-100 | 41205 | 40716 | 29188 18336 | 20329 | 8620 | M/A | 13086 |
| F-101 | 25862 | 23846 | 10220 | 20323 * | * | * | N/A |
| F-102 | 9600 | 608 4 7059 | N/A | * | * | * | 14/ A |
| F-106 | 48383 | _ | 5678 | | 4843 | * | 5368 |
| F-15 A/B | 7010 | 6603 | | | 10329 | 445 | 35208 |
| F-15 C/D | 85507 | 51443 | 10637 | | | 7456 | 31440 |
| F-15 B | 34783 | 26000 | 18494 | | N/A | /436 N/A | 71871 |
| F-16 A/B | | 85449 | 74316 | | N/A | • | 318515 |
| F-16 E | 348137 | 347668 | 307960 | 114552 | N/A | 160 | 210212 |
| ELECTRONIC | 20.4 | 000 | 025 | 000 | * | * | .017 |
| ARC-109V | .094 | .093 | .035 | | | | |
| ARC-54 | 6.143 | 6.611 | 1.131 | | | | 2.680 |
| ASN -63 | 33.199 | 32.441 | 20.407 | | 11.127 | | 14.268 |
| asn-70 | .018 | .018 | .003 | _ | .01 | .001 | .010 |
| asn-99 | 10.397 | 4.405 | 2.648 | | | .360 | 5.800 |
| ASN-108 | .795 | .795 | . 369 | | | * | .183 |
| ASQ-133 | 3.279 | 3.015 | 2.499 | | | | 3.101 |
| ASW-32 | 6.760 | 7.707 | | | | * | 3.237 |
| ₾-1035N | 1.220 | .901 | .444 | | | * | .471 |
| JTIDS | . 494 | .123 | .013 | | N/A | * | .014 |
| Lant(nav) | | | .027 | | | | .006 |
| LANT(TAR) | | .099 | | | | .014 | .036 |
| Lant (REC) | | 1.585 | 1.054 | .654 | * | * | .890 |
| HELICOPTERS | | | _ | _ | | | |
| HH-52 | 3.0 | 2.9 | .1 | .3 | | | 1.2 |
| CH-46 | 5976.7 | | | | 1067.0 | | 2075.0 |
| H~53 | 179.1 | 177.4 | 121.0 | | | | 92.0 |
| CH-47 | 11714.8 | 5154.1 | 4513.0 | | | | 8860.0 |
| H~54 | 226.7 | 125.5 | 125.0 | | | * | 65.0 |
| HH-60D | 15.4 | 2.1 | * | | * | * | * |
| SH-3 | 402.6 | 289.9 | 285.0 | 200.0 | 189.0 | 121.0 | 239.0 |
| ARMAMENT | | | | | | | |
| LLLGB | 7.6 | 7.4 | 7.4 | 5.8 | N/A | N/A | 7.1 |
| CEM | 851 | 647 | 361 | 172 | N/A | N/A | 508 |
| GBU-15 | 246 | 148 | 120 | 74 | 50 | 21 | 102 |
| MISSILES | | | | | | | |
| AMRAAM | 1764 | 1658 | 1425 | 1635 | 1362 | N/A | 1385 |
| HARM | 2088 | 399 | 364 | | | N/A | 884 |
| IIR | 6291 | 3385 | 3347 | | N/A | N/A | 4088 |
| AIM7F(R) | 386 | 250 | 156 | | 91 | N/A | 135 |
| AIM7F(GD) | | 85 | 73 | 74 | 83 | N/A | 84 |

An analysis of Table 6 indicated the following:

- All of the formulations yielded better results than the LC formulation for almost every weapon system. This fact indicates that the inclusion of the production rate (Y), or the production ratio (R or M), or both helped to explain more of the variability in costs than quantity (X) alone was capable of explaining.
- It was impossible to estimate the parameters of Mod Alt 1 and Mod Alt 2 in a number of cases due to a loss of degrees of freedom. These two models have the largest number of parameters, and estimates cannot be obtained when the data set contains fewer observations than the number of parameters to be estimated.
- Mod Alt 1 and Mod Alt 2 also produced a large number of cases in which the equation did not converge within 100 iterations or the parameter estimates were in excess of the SAS procedure capability. Note that in Modified Alt 2, no results were calculated at all for any missile programs.
- Bolton's two alternatives performed better than the TASC formulation in every case. However, at least one modified alternative was able to perform better than either of Bolton's two formulations in 27 of 37 cases. Mod Alt 2 performed better in more cases than any other alternative, with Mod Alt 1 following close behind. Mod Alt 1 and Mod Alt 2 together performed better than any other alternative in over half the cases. In a comparison of Bolton's two alternatives and the three modified alternatives, the results for the number of times that a particular formulation yielded the lowest residual sum of squares value was:

Alt 1 - 4 times Alt 2 - 6 times Mod Alt 1 - 10 times Mod Alt 2 - 12 times Mod Alt 3 - 5 times

These results do not include the B-52, F-102, F-106, and the HH-60D programs since parameter estimates could not be generated for these programs for any of the alternative formulations.

- Mod Alt 1 is a modification of the TASC formulation, and in every case where the two alternatives could be compared, Mod Alt 1 produced a small sum of squares.
- Mod Alt 2 is an expansion of Bolton's Alt 2. Therefore, Mod Alt 2 should produce a smaller sum of squares. The magnitude of the reduction in the sum of squares could not be evaluated for statistical significance. Nevertheless, in almost all cases where the two alternatives could be compared, the reduction in the sum of squares was in excess of 50%. Adding the production ratio to Bolton's Alt 2 does appear to further explain the variability in the cost of weapon system.

- Mod Alt 3, substitutes production ratio for production rate in Bolton's Alt 2. It is interesting to note that while Mod Alt 3 produced the smallest sum of squares in only five cases, this modification produced a smaller sum of squares than Bolton's Alt 2 in 15 cases where the two alternatives could be compared. It appears that in many cases, production ratio has a greater impact on costs than production rate.
- In a head to head comparison between the two most successful alternatives, Mod Alt 1 and Mod Alt 2, the results were almost equal. However, in seven of the ten cases where Mod Alt 1 provided the smallest sum of squares, the parameters of Mod Alt 2 could not be estimated. Modified Alt 1 performed better for helicopter and missile programs. Modified Alt 2 performed better for bomber, electronic, and armament programs. The two formulations were tied in the fighter category. Interestingly, these results are very similar to Bolton's findings (5:42). These patterns may be the result of some inherent characteristic of the production process for these systems, or it could be due to the differences in production policies followed for different groups of systems.

In view of these findings, there is no conclusive evidence that one superior formulation exists. Although the modified equations perform very well, a pattern exists within weapon system type that favors one formulation over the other. This pattern is consistent with Bolton's findings. If there is a sufficient basis for estimating the parameters of Mod Alt 2, it appears that this may be the better formulation since it incorporates both the production rate and the production ratio. If a reduced model is to be used, Mod Alt 1 appears to be the better choice. It appears that almost any alternative would be better than the current TASC formulation.

Every modified alternative formulation seemed to work well for some systems. Therefore, this thesis recommends that the AFSC production rate model should be modified to incorporate all three modified formulations. The user should have the ability to select from among the model formulations the best one that describes his/her particular program.

Research Objective Three

- The third objective is: (1) to investigate if statistical relationships exist for individual variables, (2) to determine which variables appear significant for different weapon systems, and (3) to identify any patterns that may exist in the occurrence of those variables.

The stepwise regression procedure outlined in Appendix B was used to identify the significant variables. In the stepwise regression procedure, variables are allowed to enter the regression equation if the partial F-test indicates that they are significant at the 85 percent level. Depending on the model specification, more than one variable was allowed to enter the regression equation. For a detailed discussion on the stepwise regression procedure, refer to the SAS Statistics Manual (13:214-220).

As noted earlier, the stepwise regression was performed on a loglinear transformation of non-linear equations. The complete SAS computer output for the stepwise regression for each formulation may be found in Appendix C.

The results displayed in Table 7 are a summary of the stepwise regression results and provide a breakout of variable occurrence frequency by model formulation. If a model formulation did not contain a particular variable in its equation, it is indicated by a dashed line. The variables in Table 7 are presented as they appear in the original formulations and not as log-linear transforms. The total eligible program line reflects the number of weapon systems out of a total of 41 programs in which that particular formulation yielded at least one significant variable.

TABLE 7

VARIABLE FREQUENCY BY FORMULATION (In Number of Occurrences)

| VARIABLE | <u>ALT1</u> | ALT2 | MOD ALTI | MOD ALT2 | MOD ALT3 |
|----------------|-------------|------|----------|----------|----------|
| x | 29 | 31 | 27 | 32 | 34 |
| Y | 15 | 9 | 16 | 5 | ~~~ |
| <u> </u> | | 8 | | 7 | |
| R ₂ | 8 | ~ | 6 | 8 | 8 |
| R² | | ~~~ | 6 | 5 | 3 |
| Total Eligible | 20 | 25 | 20 | 20 | 25 |
| Programs | 38 | 37 | 38 | 38 | 35 |

It is apparent that the cumulative quantity (X) appeared as the most significant variable in every formulation. When Y and Y^2 are both present in a formulation, their frequency of occurrences are nearly equal, and the same is true for R and R^2 . Y and Y^2 together occur more frequently in Alt 2 than R and R^2 together do in Mod Alt 3. Every variable appears to play some significant role in the formulation in which it occurs.

Table 8 provides a listing of the most significant variable combinations by model formulation. The variable combinations that are in bold italicized print indicate those combinations in a particular model formulation that yielded the lowest residual sum of squares results for that weapon system program. Although variables showed up significant for the B-52, F-102, F-106, and the HH-60D programs, no parameter estimates were generated for these programs (see Table 6). Therefore, no variables are italicized for those weapon systems. The "NONE" indicates that no variables met the entrance threshold, therefore yielding no significant variables.

TABLE 8

VARIABLE COMBINATIONS BY WEAPON SYSTEM

| | | \- . | MOD 17 M1 | 140D 11 M2 | MOD ST#2 |
|----------------|-------------|--------------------------------------|------------------------|-------------------------------------|-------------------------------------|
| BOMBERS | <u>alt1</u> | ALT2 | MOD ALT1 | MOD ALT2 | MOD ALT3 |
| | vv | x | хч | x | X |
| B-1B | X Y X | X | X | X | X |
| B-52 B-58 | NONE | NONE | NONE | NONE | NONE |
| FIGHTERS | NONE | HONE | NONE | HOULE | LICKIE |
| A-10 | Y | Y | Y | x | NONE |
| F-100 | X | X | x | X | X |
| F-101 | x | Y | Y | Y | x |
| F-102 | X | $x y y^2$ | $\tilde{x} \times R^2$ | \hat{x} y^2 R | X |
| F-106 | x | X | X | X | X |
| F-15A/B | X | X | X | Y | X |
| F-15C/D | YR | | YR | $X Y Y^2 R^2$ | R |
| F-15E | Y | Y Y ² | Y | ¥2 | X |
| F-16A/B | X | X | R | R | X |
| F-16E | NONE | NONE | NONE | NONE | NONE |
| ELECTRONIC | | | | | |
| ARC-109V | Y | X | Y | X | X |
| ARC-54 | X | X | X | X | X |
| ASN-63 | NONE | NONE | NONE | NONE | NONE |
| asn-70 | Y | $Y Y^2$ | Y | Y YZ | NONE |
| asn-99 | Y R | $x y^2$ | YR | x Y ² | X |
| ASN-108 | X | X 2 | X | X , | X |
| ASQ-133 | X | y y ² | X | $\hat{x} y^2$ | X |
| asw-32 | X | X | x R ² | X R ² | X |
| CP-1035N | R | NONE | | | NONE |
| JTIDS | XR | X | X R | X R | X R |
| LTN(NAV) | X | XY | X , | XY ₂ | X 2 |
| LTN(TAR) | XYR | XY | X R ² | X R ² | X R ² |
| LTN(REC) | X | X | X | X | X |
| HELICOPTERS | | | R ² | 2 | •• |
| HH-52 | X | X | | R R ² | X |
| CH-46 | XY | X | XY | X R | X R |
| H-53 | X | X2 | X | X2 | X |
| CH-47 | XY | X Y Y ² | XY | $\tilde{x} y y^2$ | X R |
| H-54 | X | X | X | X | X |
| HH-60D | XYR | X | XYR | X | X |
| SH-3 | X | X | X | X | X |
| ARMAMENT | v | • | v | v | • |
| LLLGB | X | X X Y ₂ Y ² | Y R ² | X | X X R |
| CEM CBU-15 | Y Y | Y Y ² | Y | X R Y Y ² | X |
| MISSILES | | | • | | ^ |
| AMRAAM | x | X | x | x . | X . |
| HARM | XY | X | XY | $\hat{\mathbf{x}}$ R R ² | $\hat{\mathbf{x}}$ R R ² |
| IIR | XR | X | XYR | X R R ² | X R R ² |
| AIM7F(R) | XX | X | XYR ² | XR | X |
| AIM7F(GD) | X R | x | X | X | X R |
| ALTITE (OU) | ~ ~ | ^ | ^ | ^ | ~ W |

An analysis of Table 8 yielded the following results:

- In Alt 1, different variable combinations occurred in each weapon system group. Except for inclusion of the X variable in various combinations, no combination was dominant in any of the weapon system types.
- In Alt 2, the Y Y^2 combination occurred in almost every weapon system type. The only variable pattern occurred in the missile and helicopter program types in which the single X variable was almost exclusively dominant.
- In Mod Alt 1, different variable combination occurred in each weapon system group. The X Y combination occurred in almost every missile program.
- In Mod Alt 2, the Y Y^2 and R R^2 combinations occurred in different weapon system types. The only variable pattern occurred in the missile programs where the X R combination was rather dominant.
- In Mod Alt 3, two patterns were identified. For fighter, bomber, electronic and helicopter programs, the single X variable occurred almost exclusively. For missile programs, the X R combination was heavily favored.

In these findings, the missile program type seemed to be the only group which consistently yielded a distinct pattern of variable combinations for all model formulations. In general, no pattern existed for the other weapon system types across the different model formulations. Therefore, no guidelines were developed to explain why one alternative model performed better for certain weapon system types than other formulations.

Table 9 provides a summary of variable combinations by formulation. The table shows the number of times a particular variable combination turned up significant for each model formulation. The total multivariate line shows the total number of multivariate combinations that occurred in each formulation. The total eligible program line reflects the number of weapon systems out of a total of 41 programs in

which that particular formulation yielded at least one significant variable. The asterisk identifies those variable combinations that were not possible in that particular model formulation.

TABLE 9

VARIABLE COMBINATIONS BY FORMULATION

| Combination | Alt 1 | <u>Alt 2</u> | Mod Alt 1 | Mod Alt2 | Mod Alt 3 |
|--------------------------------------|-------|--------------|-----------|----------|-----------|
| X _ | 19 | 25 | 17 | 19 | 26 |
| \mathbf{Y} or \mathbf{Y}_{2}^{2} | 6 | 3 | 5 | 1 | * |
| R or R ² | 1 | * | 3 | 2 | 1 |
| X Y | 5 | 2 | 4 | 1 | * |
| $x y^2$ | * | 1 | * | 2 | * |
| X R | 3 | * | 1 | 4 | 5 |
| $x R^2$ | * | * | 1 | 1 | 1 |
| Y R | 2 | * | 2 | 0 | * |
| $Y R_{a}^{2}$ | * | * | 1 | 0 | * |
| $\mathbf{Y} \mathbf{Y}^2$ | * | 3 | * | 2 | * |
| $R R^2$ | * | * | 0 | 1 | 0 |
| X Y_R | 2 | * | 2 | 0 | * |
| х ч ² в | * | * | * | 1 | * |
| $X Y R^2$ | * | * | 2 | 0 | * |
| $x y y_2^2$ | * | 3 | * | 1 | * |
| $X R R^2$ | * | * | 0 | 2 | 2 |
| $\ddot{x} \ddot{y} \ddot{y}^2 R^2$ | * | * | * | 1 | * |
| Total Multivariate | : | | | | |
| Combinations | 12 | 9 | 13 | 16 | 8 |
| Total Eligible | | | | | |
| Programs | 38 | 37 | 38 | 38 | 35 |

Analysis of Table 9 showed that multivariate combinations accounted for less than half of the total eligible programs in each formulation. Not surprisingly, the most multivariate combinations occurred in the formulations with a large number of parameters in their equations. Surprisingly, the single X variable combination was the dominant form in all of the model formulations. This means that all model formulations essentially reverted back to a model structure in which cumulative

quantity (X) was the only significant term. In some cases, this structure was the basic learning curve formulation. However, the results did indicate that the presence of the other variables did enable the formulation to explain more of the variability in cost.

Also, each model formulation seemed to favor either production rate (Y) or production ratio (R) in those equations where both variables were present. Alt 1 and Mod Alt 1 favored production rate while Mod Alt 2 and Mod Alt 3 preferred production ratio.

The results in Table 10 provide a summary of the frequency of occurrence for each variable combination that yielded the lowest residual sum of squares result. Interestingly, certain significant variable combinations yielded the best results in different model formulations.

TABLE 10

LOWEST SUM OF THE SQUARED RESIDUAL VALUE BY VARIABLE COMBINATION
(In Number of Occurrences)

| VARIABLE COMBINATION | # OF OCCURRENCES |
|---|------------------|
| x | 17 |
| Y | 1 |
| Ŷ ² | 1 |
| R _a | 0 |
| R^2 | 1 |
| X Y_ | 4 |
| $\mathbf{x} \mathbf{y}^2$ | 1 |
| X R | 3 |
| x R ² | 1 |
| y y ² | |
| R R ² | ō |
| $x y y^2$ | i |
| X Y R ² | 1 |
| $\hat{\mathbf{x}} \hat{\mathbf{y}} \hat{\mathbf{y}}^2 \mathbf{R}^2$ | 1 |
| NONE | 3 |
| a v wa vad | |

Total Eligible Programs 37

Analysis of Table 10 provided insight into those combinations that not only occurred frequently, but also gave the lowest residual sum of squares results. This seemed to put the analysis into a more meaningful perspective. Table 10 showed that the single X variable combination not only occurred the most times, but also yielded the most "lowest residual sum of squares" results. Interestingly, different model formulations incorporating this variable make up 17 occurrences out of the 37 programs.

In addition, analysis of the quadratic terms that allowed calculation of either the optimal rate or ratio of production yielded a surprising result. It seems that solving for the optimal rate of production is important as the Y Y² combination yielded the best results twice. On the other hand, the R R² combination never yielded the lowest residual sum of squares result. Therefore, it seems that solving for the optimal ratio of production was less important than solving for the optimal rate of production. Interestingly, three programs had the lowest residual sum of squares where no variables turned up significant.

In conclusion, the results of this objective show that the cumulative quantity variable (X) is extremely significant in explaining the variability of weapon system costs. Also, inclusion of either production rate (Y) or production ratio (R), while not always significant, combined with X to yield results that were superior to the basic learning curve. Finally, the findings show that solving for the optimal rate of production is indeed worthwhile and that formulations that incorporate this approach should be included in the Production Rate Model.

V. Conclusion

The cost estimating profession's need for tools that generate credible production estimates in today's dynamic acquisition environment requires a constant search for better methods and procedures. The AFSC Production Rate Model's effort to capture rapid changes in production rates or buy quantities is a step in that direction. Refinement of the Production Rate Model to improve its performance was the objective of this thesis effort.

Summary of Results

This thesis showed that as a result of the formulations developed by TASC and Bolton, the inclusion of production rate and production ratio yielded results which were significant from a statistical and logical viewpoint. Furthermore, the effort to refine the AFSC Production Rate Model has succeeded.

Three modified formulations were developed in this effort. The TASC and Bolton formulations were modified to include quadratic expressions incorporating production rate and/or production ratio in the equations. The Modified Alt 1 equation took the production ratio variable and made it a quadratic function of the production rate in the TASC formulation. The Modified Alt 2 equation added a quadratic function to solve for the optimal ratio of production in addition to the optimal rate of production in Bolton's Alt 2 formulation. The Modified Alt 3 formulation took the Bolton Alt 2 model structure and substituted production ratio for production rate. Based on the residual sum of

squares comparison, these three modified formulations outperformed TASC's and Bolton's original models.

Unfortunately, there was no conclusive evidence to support the existence of a superior formulation. Although the three modified equations performed very well, some limitations on their potential use were discussed. These included non-calculation of the model parameters due to a loss of degrees of freedom and non-convergence of the unknown model parameters within the specified number of iterations. The limitations precluded recommending any modified alternative as a singular replacement formulation for all programs, even though their performance in reducing the residual sum of squares was outstanding.

The Modified Alt 2 formulation turned out to be the best performer, although it suffered from the limitations discussed in the previous section. Although the Modified Alt 3 formulation did not consistently perform better than the Modified Alt 1 or Modified Alt 2 formulation, in direct comparison it did not suffer from the same limitations. Compared with Bolton's Alt 1 and Alt 2, however, Mod Alt 3 yielded slightly better results. All three modified formulations surpassed the basic learning curve and TASC formulation in performance.

In addition, the findings of research objective three showed that solving for the optimal ratio of production was not as significant as originally thought. The findings did indicate, however, that the inclusion of cumulative quantity (X) and either production rate (Y) or production ratio (R), while not always significant, yielded results that were superior to the basic learning curve and the TASC formulation. The findings showed that solving for the optimal rate of production was

statistically meaningful and that the bathtub curve was a valid and logical concept.

Therefore, it was recommended that the three modified alternative formulations be incorporated into the AFSC Production Rate model instead of the TASC model formulation. The user should be given the option to determine the formulation that best fits his/her weapon system program.

Research Limitations

The research in this thesis was subject to several limitations. First, due to the non-linear procedure, statistical tests which are normally used to determine model specification and measurement were not applicable. Therefore, the ability to test parameter significance or model fit was extremely difficult. However, the findings obtained in the log-linear analysis supported the logic behind the model concept, so the results obtained in this research should be valid.

Second, the empirical relationship between production rate and production ratio was not investigated. The results appear to be reasonable based on a mere residual sum of squares comparison and the use of annual buy schedules as a proxy for production rate as done in Bolton's thesis. However, because a sensitivity analysis, the model's stability or performance using different evaluation criteria or some other measure of production rate (besides the proxy "annual buy quantity" used in this evaluation) may yield different results.

Third, since the exact empirical relationships between production rate and production ratio were not found, the value for either the optimal rate of production or optimal ratio of production was not

calculated. If this relationship can be empirically determined, tables for the various parameters according to the optimal values may be developed.

Finally, as Bolton states, "the research is limited in that the effects of production rate changes still cannot be separated from the effects of learning because of collinearity in the data" (3:45).

Although the non-linear regression technique reduces the effects of multicollinearity, they do not eliminate the problem.

Recommendations for Future Research

Obviously, the recommendations for future research begin with investigating the research limitations encountered in this effort. Therefore, the first area of research is to determine the sensitivity of the recommended modified formulations. The relationship between production rate and production ratio has a definite influence on the model's ability to predict cost. Performing a sensitivity analysis by varying the input variables according to different scales or measures would enable one to determine the stability of the recommended formulation. In any case, the stability or instability of the modified alternative formulations may or may not change the recommendations made in this thesis.

The second area of research would be to refine the TASC data base by including actual contract data where applicable and updating the budgetary estimates for current on-going programs. The modified formulations' predictive ability could be tested by taking the refined data base and analyzing it with the SAS programs developed for each

modified formulation. Successful results would help to validate the models being recommended in this thesis.

Finally, further investigation of weapon system cost behavior due to the effect of changes in production rate should be attempted by future researchers. Other factors which influence production rate should be empirically defined and incorporated in model formulations to further refine the Production Rate Model. Each advancement in the cost estimating profession allows the development of new concepts and techniques that refine the methodology used to estimate weapon system production costs.

Appendix A: TASC Data Set

The data used in this thesis was extracted from the AFSC Production Rate Model Data Handbook (15). As discussed in chapter three, rule of thumb lot plot point (LPP) values for each program were calculated and included in the data set. The lot plot points were generated according to the following criteria:

For Lot 1 Only:

If Lot Quantity > 10, LPP = Lot Quantity / 3.

Otherwise LPP = Lot Quantity / 2.

For all subsequent Lots: LPP = Lot Quantity / 2.

The data set is provided in the following tables:

A.1 - Bomber Aircraft Programs

Table A.1.1

B-1B Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | <u>LPP</u> |
|-------------|-----|----------|---------------------|------------|
| 1982 | 1 | 1 | 535.8 | .5 |
| 1983 | 2 | 7 | 260.3 | 4.5 |
| 1984 | 3 | 10 | 200.5 | 13.0 |
| 1985 | 4 | 34 | 142.0 | 35.0 |
| 1986 | 5 | 48 | 111.3 | 76.0 |

Table A.1.2

B-52 Cost/Quantity Data

| Fiscal Year | <u>Lot</u> | Quantity | Recurring Unit Cost | LPP |
|-------------|------------|----------|---------------------|--------|
| 1952 | 1 | 20 | 112.5 | 6.67 |
| 1953 | 2 | 43 | 37.0 | 41.50 |
| 1954 | 3 | 25 | 28.6 | 75.50 |
| 1955 | 4 | 77 | 32.3 | 126.50 |
| 1956 | 5 | 133 | 23.4 | 231.50 |
| 1957 | 6 | 202 | 28.4 | 399.00 |
| 1958 | 7 | 101 | 27.3 | 550.50 |
| 1959 | 8 | 39 | 27.3 | 620.50 |
| 1960 | 9 | 62 | 35.4 | 671.00 |
| 1961 | 10 | 40 | 35.0 | 722.00 |

Table A.1.3

B-58 Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | <u>LPP</u> |
|-------------|-----|----------|---------------------|------------|
| 1958 | 1 | 17 | 93.86 | 5.67 |
| 1959 | 2 | 36 | 80.26 | 35.00 |
| 1960 | 3 | 20 | 73.16 | 63.00 |
| 1961 | 4 | 30 | 36.56 | 88.00 |

A.2 - Fighter Aircraft Programs

Table A.2.1

A-10 Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|--------------|-----|----------|---------------------|--------|
| 1975 | 1 | 22 | 12.37 | 7.33 |
| 1976 | 2 | 53 | 9,16 | 48.50 |
| 197 T | 3 | 20 | 8.2 | 85.00 |
| 1977 | 4 | 100 | 8.2 | 145.00 |
| 1978 | 5 | 144 | 7.82 | 267.00 |
| 1979 | 6 | 144 | 7.59 | 411.00 |
| 1980 | 7 | 144 | 7.82 | 555.00 |
| 1981 | 8 | 60 | 10.18 | 657.00 |
| 1982 | 9 | 20 | 13.64 | 697.00 |

Table A.2.2

F-100 Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|-------------------|
| 1952 | 1 | 23 | 6.51 | $\overline{7.67}$ |
| 1953 | 2 | 545 | 3.45 | 295.50 |
| 1954 | 3 | 593 | 3.08 | 864.50 |
| 1955 | 4 | 559 | 3.10 | 1440.50 |
| 1956 | 5 | 557 | 2.50 | 1998.50 |

Table A.2.3

F-101 Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|--------|
| 1954 | 1 | 31 | 16.85 | 10.33 |
| 1955 | 2 | 84 | 7.58 | 73.00 |
| 1956 | 3 | 309 | 6.91 | 269.50 |
| 1957 | 4 | 206 | 5.76 | 527.00 |
| 1958 | 5 | 84 | 5.27 | 672.00 |
| 1959 | 6 | 93 | 5.22 | 760.50 |

Table A.2.4

F-102 Cost/Quantity Data

| Fiscal Year | <u>Lot</u> | Quantity | Recurring Unit Cost | LPP |
|-------------|------------|----------|---------------------|--------------------|
| 1954 | <u>1</u> | 37 | 11.66 | $\overline{12.33}$ |
| 1955 | 2 | 108 | 5.17 | 91.00 |
| 1956 | 3 | 562 | 3.5 | 426.00 |
| 1957 | 4 | 140 | 2.21 | 777.00 |

Table A.2.5

F-106 Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|-------|
| 1956 | 1 | 42 | 34.19 | 14.0 |
| 1957 | 2 | 88 | 10.54 | 86.0 |
| 1958 | 3 | 45 | 11.64 | 152.5 |
| 1959 | 4 | 165 | 7.59 | 257.5 |

Table A.2.6

F-15A/B Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|-----|
| 1973 | 1 | 30 | 25.597 | 10 |
| 1974 | 2 | 62 | 19.556 | 61 |
| 1975 | 3 | 72 | 17.183 | 128 |
| 1976 | 4 | 108 | 17.126 | 218 |
| 197T | 5 | 24 | 16.021 | 284 |
| 1977 | 6 | 108 | 16.272 | 350 |

Table A.2.7

F-15C/D Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|--------|
| 1978 | 1 | 97 | 17.249 | 32.33 |
| 1979 | 2 | 78 | 15.588 | 136.00 |
| 1980 | 3 | 60 | 15.508 | 205.00 |
| 1981 | 4 | 42 | 17.665 | 256.00 |
| 1982 | 5 | 36 | 19.943 | 295.00 |
| 1983 | 6 | 39 | 19.308 | 332.50 |
| 1984 | 7 | 36 | 21.954 | 370.00 |
| 1985 | 8 | 48 | 21.017 | 412.00 |

Table A.2.8

F-15E Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|----------|----------|---------------------|-----|
| 1986 | <u> </u> | 60 | 20.544 | 20 |
| 1987 | 2 | 72 | 19.203 | 96 |
| | 2 | 96 | 17.608 | 180 |
| 1988 | . J | 96 | 16.175 | 276 |
| 1989 | 7 | 96 | 16.041 | 372 |
| 1990 | 5 | | 17.927 | 468 |
| 1991 | 6 | 96 | 17.347 | |

Table A.2.9

F-16A/B Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|-------|
| 1978 | 1 | 105 | 10.14 | 35.0 |
| | 2 | 145 | 7.74 | 177.5 |
| 1979 | 2 | | 8.04 | 337.5 |
| 1980 | 3 | 175 | | 515.0 |
| 1981 | 4 | 180 | 5.05 | 665.0 |
| 1982 | 5 | 120 | 5.13 | 663.0 |

Table A.2.10

F-16E Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|----------|----------|---------------------|------|
| | 1 | 120 | 9.86 | 40 |
| 1983 | <u> </u> | 144 | 10.58 | 192 |
| 1984 | 2 | | 14.55 | 339 |
| 1985 | 3 | 150 | | 522 |
| 1986 | 4 | 216 | 11.93 | |
| 1987 | 5 | 216 | 11.28 | 738 |
| 1988 | 6 | 216 | 11.02 | 954 |
| | 7 | | 10.88 | 1170 |
| 1989 | , | 216 | | 1386 |
| 1990 | 8 | 216 | 10.69 | |
| 1991 | 9 | 216 | 10.61 | 1602 |
| 1992 | 10 | 216 | 10.54 | 1818 |

A.3 - Electronics Programs

Table A.3.1

ARC-109V Cost/Quantity Data

| Fiscal Year | <u>Lot</u> | Quantity | Recurring Unit Cost .0487 | <u>LPP</u> 2.0 |
|--------------|------------|----------|------------------------------|-------------------|
| 1972 1973 | 2 | 24 | .0393 | 16.0 |
| 1974 | 3 | 79 | .0285 | 67.5 |
| 1975 | 4 | 226 | .0313 .0303 | 220.0 387.0 |
| 1976 | 5 | 108 | .0303 | |

Table A.3.2

ARC-54 Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|--------|
| 1964 | | 900 | .0210 | 300.0 |
| 1964 | 2 | 853 | .0165 | 1326.5 |
| 1965 | 3 | 1381 | .0164 | 2443.5 |
| 1966 | 4 | 1160 | .0145 | 3714.0 |
| 1966 | 5 | 300 | .0144 | 4444.0 |
| 1966 | 6 | 3103 | .0139 | 6145.5 |
| 1966 | 7 | 2650 | .0143 | 9022.0 |

Table A.3.3

ASN-63 Cost/Quartity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|---------|
| 1966 | 1 | 781 | .1866 | 260.33 |
| 1967 | 2 | 149 | .1744 | 855.50 |
| 1968 | 3 | 287 | .1769 | 1073.50 |
| 1969 | 4 | 141 | .1817 | 1287.50 |
| 1970 | 5 | 92 | .1772 | 1404.00 |
| 1971 | 6 | 135 | .2189 | 1517.50 |
| 1972 | 7 | 108 | .1911 | 1639.00 |
| 1973 | 8 | 158 | .1917 | 1772.00 |
| 1974 | 9 | 36 | .2005 | 1869.00 |
| 1975 | 10 | 36 | .2145 | 1905.00 |

Table A.3.4

ASN-70 Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|--------|
| 1966 | 1 | 152 | .0350 | 50.67 |
| 1967 | 2 | 250 | .0353 | 277.00 |
| 1968 | 3 | 81 | .0342 | 442.50 |
| 1969 | 4 | 58 | .0356 | 512.00 |
| 1970 | 5 | 26 | .0370 | 554.00 |
| 1971 | 6 | 8 | .0399 | 571.00 |
| 1972 | 7 | 8 | .0370 | 579.00 |
| 1973 | 8 | 11 | .0427 | 588.50 |

Table A.3.5

ASN-99 Cost/Quantity Data

| <u>Fiscal Year</u> | <u>Lot</u> | Quantity | Recurring Unit Cost | LPP |
|--------------------|------------|----------|---------------------|-------------------|
| 1968 | 1 | 157 | .0464 | 52. 33 |
| 1969 | 2 | 196 | .0404 | 255.00 |
| 1970 | 3 | 185 | .0413 | 445.50 |
| 1971 | 4 | 243 | .0433 | 659.50 |
| 1972 | 5 | 24 | .0570 | 793.00 |
| 1973 | 6 | 72 | .0624 | 841.00 |
| 1974 | 7 | 56 | .0635 | 905.00 |
| 1975 | 8 | 117 | .0684 | 991.50 |

Table A.3.6

CP-1035N Cost/Quantity Data

| Fiscal Year | <u>Lot</u> | Quantity | Recurring Unit Cost | LPP |
|-------------|------------|----------|---------------------|-----|
| 1970 | 1 | 12 | .1248 | 4 |
| 1971 | 2 | 26 | .0903 | 25 |
| 1972 | 3 | 48 | .1236 | 62 |
| 1973 | 4 | 48 | .1287 | 110 |
| 1974 | 5 | 50 | .1310 | 159 |
| 1975 | 6 | 80 | .1154 | 224 |

Table A.3.7

LANTIRN (Nav Pod) Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|-----|
| 1985 | 1 | 4 | 1.75 | |
| 1986 | 2 | 34 | 1.3199 | 21 |
| 1987 | 3 | 138 | 1.0761 | 107 |
| 1988 | 4 | 144 | .9679 | 248 |
| 1989 | 5 | 144 | .9184 | 392 |
| 1990 | 6 | 144 | .8854 | 536 |
| 1991 | 7 | 116 | .8643 | 666 |

Table A.3.8

LANTIRN (Target Pod) Cost/Quantity Data

| <u>Fiscal Year</u> | <u>Lot</u> | Quantity | Recurring Unit Cost | LPP |
|--------------------|------------|----------|---------------------|-----|
| 1985 | 1 | 4 | 1.4375 | |
| 1986 | 2 | 34 | 1.1286 | 21 |
| 1987 | 3 | 128 | .9375 | 102 |
| 1988 | 4 | 144 | .8490 | 238 |
| 1989 | 5 | 144 | .8081 | 382 |
| 1990 | 6 | 144 | .7795 | 526 |
| 1991 | 7 | 116 | .7619 | 656 |

Table A.3.9

LANTIRN (Target Recognizer) Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | <u>LPP</u> 26.33 |
|-------------|-----|----------|---------------------|---------------------|
| 1988 | 1 | 79 | .4383 | 26.33 |
| 1989 | 2 | 192 | .3353 | 175.00 |
| 1990 | 3 | 192 | .2975 | 367.00 |
| 1991 | 4 | 192 | .2865 | 559.00 |
| 1992 | 5 | 65 | .2693 | 687.50 |

Table A.3.10

ASQ-133 Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|--------|
| 1970 | 1 | 14 | .5856 | 4.67 |
| 1971 | 2 | 19 | .5862 | 23.50 |
| 1972 | 3 | 68 | . 4255 | 67.00 |
| 1973 | 4 | 67 | .3828 | 134.50 |
| 1974 | 5 | 81 | .3535 | 208.50 |
| 1975 | 6 | 58 | .3355 | 278.00 |

Table A.3.11

ASN-108 Cost/Quantity Data

| Fiscal Year | <u>Lot</u> | Quantity | Recurring Unit Cost | LPP |
|-------------|------------|----------|---------------------|-------|
| 1972 | <u> </u> | 8 | .1373 | 4.0 |
| 1973 | 2 | 31 | .1048 | 23.5 |
| 1974 | 3 | 77 | .0874 | 77.5 |
| 1975 | 4 | 216 | .0943 | 224.0 |
| 1976 | 5 | 108 | .0872 | 386.0 |

Table A.3.12

ASW-32 Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|----------|----------|---------------------|-----|
| 1970 | <u> </u> | 12 | .2338 | 4 |
| 1971 | 2 | 26 | .1643 | 25 |
| 1972 | 3 | 48 | .1524 | 62 |
| 1973 | 4 | 48 | .0974 | 110 |
| 1974 | 5 | 50 | .1441 | 159 |
| 1975 | 6 | 80 | .1518 | 224 |

Table A.3.13

JTIDS Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|-------|
| 1986 | 1 | 45 | . 4068 | 15.0 |
| 1987 | 2 | 76 | .2764 | 83.0 |
| 1988 | 3 | 77 | . 2466 | 159.5 |
| 1989 | 4 | 72 | .2308 | 234.0 |
| 1990 | 5 | 57 | .2205 | 298.5 |

A.4 - Helicopter Programs

Table A.4.1

HH-52 Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | <u>LPP</u> |
|-------------|-----|----------|---------------------|------------|
| 1963 | 1 | 28 | 1.577 | 9.33 |
| 1964 | 2 | 15 | 1.104 | 35.50 |
| 1965 | 3 | 17 | 1.085 | 51.50 |
| 1966 | 4 | 15 | 1.012 | 67.50 |
| 1967 | 5 | 12 | 1.041 | 81.00 |
| 1968 | 6 | 12 | 1.055 | 93.00 |

Table A.4.2

CH-46 Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|--------|
| 1965 | 1 | 14 | 7.541 | 4.67 |
| 1966 | 2 | 36 | 3.898 | 32.00 |
| 1967 | 3 | 60 | 2.766 | 80.00 |
| 1968 | 4 | 85 | 2.419 | 152.50 |
| 1969 | 5 | 199 | 1.986 | 294.50 |
| 1970 | 6 | 92 | 2.236 | 440.00 |
| 1971 | 7 | 90 | 2.370 | 531.00 |
| 1972 | 8 | 48 | 2.547 | 600.00 |

Table A.4.3

H-53 Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|----------|----------|---------------------|--------|
| 1965 | <u> </u> | 10 | 6.752 | 3.33 |
| 1966 | 2 | 131 | 4.264 | 75.50 |
| 1967 | 3 | 140 | 3.762 | 211.00 |
| 1968 | 4 | 12 | 3.382 | 287.00 |
| 1969 | 5 | 30 | 3.341 | 308.00 |
| 1970 | 6 | 8 | 3.154 | 327.00 |
| 1971 | 7 | 30 | 3.685 | 346.00 |
| 1972 | 8 | 6 | 3.947 | 364.00 |

Table A.4.4

CH-47 Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | <u>LPP</u> |
|-------------|-----|----------|---------------------|------------|
| 1962 | 1 | 18 | 6.181 | 6.0 |
| 1963 | 2 | 24 | 5.226 | 30.0 |
| 1964 | 3 | 24 | 4.559 | 54.0 |
| 1965 | 4 | 60 | 3.459 | 96.0 |
| 1966 | 5 | 72 | 2.760 | 162.0 |
| 1967 | 6 | 160 | 2.307 | 278.0 |
| 1968 | 7 | 84 | 2.313 | 400.0 |
| 1969 | 8 | 143 | 2.695 | 513.5 |
| 1970 | 9 | 45 | 3.463 | 607.5 |
| 1971 | 10 | 36 | 3.085 | 648.0 |
| 1972 | 11 | 12 • | 3.671 | 672.0 |
| 1973 | 12 | 12 | 3.852 | 684.0 |

Table A.4.5

H-54 Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | <u>LPP</u> |
|-------------|-----|----------|---------------------|------------|
| 1964 | 1 | 6 | 5.248 | 3.0 |
| 1967 | 2 | 24 | 3.388 | 18.0 |
| 1968 | 3 | 30 | 2.801 | 45.0 |
| 1969 | 4 | 23 | 3.402 | 71.5 |
| 1970 | 5 | 6 | 3.083 | 86.0 |

Table A.4.6

HH-60D Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|------|
| 1986 | 1 | 3 | 9.2 | 1.5 |
| 1987 | 2 | 25 | 7.1 | 15.5 |
| 1988 | 3 | 35 | 6.7 | 45.0 |
| 1989 | 4 | 29 | 6.6 | 77.5 |

Table A.4.7

SH-3 Cost/Quantity Data

| Fiscal Year | <u>Lot</u> | Quantity | Recurring Unit Cost | LPP |
|-------------|------------|----------|---------------------|--------|
| 1960 | 1 | 20 | 3.327 | 6.67 |
| 1961 | 2 | 49 | 2.480 | 44.50 |
| 1962 | 3 | 71 | 2.319 | 104.50 |
| 1963 | 4 | 45 | 1.811 | 162.50 |
| 1964 | 5 | 36 | 1.870 | 203.00 |
| 1965 | 6 | 36 | 1.589 | 239.00 |
| 1966 | 7 | 30 | 1.703 | 272.00 |
| 1967 | 8 | 48 | 1.930 | 311.00 |
| 1970 | 9 | 15 | 2.144 | 342.50 |

A.5 - Tactical Armament Programs

Table A.5.1

Low Level Laser Guided Bomb (LLLGB) Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | <u>LPP</u> |
|-------------|-----|----------|---------------------|--------------------|
| 1983 | 1 | 1600 | .0275 | 533 .33 |
| 1984 | 2 | 2950 | .0206 | 3075.00 |
| 1985 | 3 | 3740 | .0189 | 6420.00 |
| 1986 | 4 | 8980 | .0162 | 12780.00 |
| 1987 | 5 | 9620 | .0147 | 22080.00 |
| 1988 | 6 | 14400 | .0137 | 34090.00 |
| 1989 | 7 | 15600 | .0129 | 49090.00 |
| 1990 | 8 | 15600 | .0123 | 64690.00 |
| 1991 | c | 15600 | .0118 | 80290.00 |
| 1992 | 10 | 11910 | .0115 | 94045.00 |

Table A.5.2

Combined Effect Munitions (CEM) Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|-------------------|
| 1983 | 1 | 172 | .06924 | 57. 33 |
| 1984 | 2 | 1260 | .03038 | 802.00 |
| 1985 | 3 | 6125 | .01988 | 4494.50 |
| 1986 | 4 | 14220 | .01765 | 14667.00 |
| 1987 | 5 | 28450 | .01619 | 36002.00 |
| 1988 | 6 | 35020 | .01401 | 67737.00 |
| 1989 | 7 | 48910 | .01258 | 109702.00 |
| 1990 | 8 | 37509 | .01181 | 152911.50 |

Table A.5.3

GBU-15 Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | <u>LPP</u> |
|-------------|-----|----------|---------------------|------------|
| 1980 | 1 | 40 | .1975 | 13.33 |
| 1981 | 2 | 65 | .2000 | 72.50 |
| 1982 | 3 | 340 | .1439 | 275.00 |
| 1983 | 4 | 250 | .1483 | 570.00 |
| 1984 | 5 | 320 | .1308 | 855.00 |
| 1985 | 6 | 600 | .1718 | 1315.00 |
| 1986 | 7 | 600 | .1539 | 1915.00 |
| 1987 | 8 | 600 | .1483 | 2515.00 |
| 1988 | 9 | 600 | .1420 | 3115.00 |

A.6 - Tactical Missile Programs

Table A.6.1

AMRAAM Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|----------|
| 1985 | 1 | 194 | 1.233 | 64.67 |
| 1986 | 2 | 1057 | .512 | 722.50 |
| 1987 | 3 | 1964 | .342 | 2233.00 |
| 1988 | 4 | 2996 | .257 | 4713.00 |
| 1989 | 5 | 2900 | .232 | 7661.00 |
| 1990 | 6 | 2900 | .194 | 10561.00 |
| 1991 | 7 | 2900 | .182 | 13461.00 |
| 1992 | 8 | 3000 | .170 | 16411.00 |
| 1993 | 9 | 3000 | .158 | 19411.00 |
| 1994 | 10 | 3763 | .155 | 22792.50 |

Table A.6.2

HARM Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|----------|
| 1981 | 1 | 80 | .809 | 26.67 |
| 1982 | 2 | 236 | .517 | 198.00 |
| 1983 | 3 | 396 | . 400 | 514.00 |
| 1984 | 4 | 687 | .314 | 1055.50 |
| 1985 | 5 | 1745 | .249 | 2271.50 |
| 1986 | 6 | 2468 | . 223 | 4378.00 |
| 1987 | 7 | 2119 | .208 | 6671.50 |
| 1988 | 8 | 2132 | .197 | 8797.00 |
| 1989 | 9 | 3000 | .184 | 11363.00 |
| 1990 | 10 | 3000 | .177 | 14363.00 |
| 1991 | 11 | 1098 | .196 | 16412.00 |

Table A.6.3

IIR Maverick Cost/Quantity Data

| Fiscal Year | <u>Lot</u> | Quantity | Recurring Unit Cost | LPP |
|-------------|------------|----------|---------------------|----------|
| 1982 | 1 | 200 | .309 | 66.66 |
| 1983 | 2 | 900 | .135 | 650.00 |
| 1984 | 3 | 2600 | .083 | 2400.00 |
| 1985 | 4 | 5729 | .082 | 6564.50 |
| 1986 | 5 | 9000 | .062 | 13929.00 |
| 1987 | 6 | 12000 | .057 | 24429.00 |
| 1988 | 7 | 12000 | .055 | 36429.00 |
| 1989 | 8 | 12000 | .053 | 48429.00 |
| 1990 | 9 | 6235 | .057 | 57546.50 |

Table A.6.4

AIM-7F (Raytheon) Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|---------|
| 1972 | 1 | 100 | .741 | 33.33 |
| 1973 | 2 | 225 | .378 | 212.50 |
| 1975 | 3 | 600 | .199 | 625.00 |
| 1976 | 4 | 800 | .169 | 1325.00 |
| 1977 | 5 | 1100 | .134 | 2075.00 |
| 1978 | 6 | 1400 | .116 | 3525.00 |
| 1979 | 7 | 900 | .111 | 4675.00 |
| 1980 | 8 | 1144 | .095 | 5697.00 |

Table A.6.5

AIM-7F (General Dynamics) Cost/Quantity Data

| Fiscal Year | Lot | Quantity | Recurring Unit Cost | LPP |
|-------------|-----|----------|---------------------|------|
| 1975 | 1 | 15 | 1.551 | 5 |
| 1976 | 2 | 70 | .379 | 50 |
| 1977 | 3 | 210 | .228 | 190 |
| 1978 | 4 | 210 | .195 | 400 |
| 1979 | 5 | 750 | .130 | 880 |
| 1980 | 6 | 1310 | .090 | 1910 |

Appendix B: SAS Computer Programs

This section provides the SAS programs used to run the stepwise regression procedure and the non-linear regression procedure. For a detailed description of specific program steps, consult the SAS User's Guide: Statistics (SAS) (13).

B.1 - Alt 1 Stepwise Regression

This program was used to run the stepwise regression procedure for the Alt 1 formulation.

```
OPTIONS LINESIZE = 80;
DATA INPM;
  INFILE INPM;
INPUT SYS $ LOT QTY AUC MID;
 RATE = QTY;
  RATIO = (QTY/LAG1(QTY));
    IF LOT = 1 THEN RATIO = 1;
  YT = LOG(AUC);
  Z1 = LOG(MID);
  Z2 = LOG(RATE);
  Z3 = LOG(RATIO);
PROC SORT DATA = INPM;
  BY SYS;
PROC STEPWISE;
  BY SYS;
MODEL YT = Z1 Z2 Z3/DETAILS;
```

B.2 - Alt 2 Stepwise Regression

This program was used to run the stepwise regression procedure for the Alt 2 formulation.

```
OPTIONS LINESIZE = 80;
DATA INPM;
INFILE INPM;
INPUT SYS $ LOT QTY AUC MID;
RATE = QTY;
RATIO = (QTY/LAG1(QTY));
IF LOT = 1 THEN RATIO = 1;
YT = LOG(AUC);
Z1 = LOG(MID);
```

```
Z2 = RATE * LOG(MID);
Z3 = RATE**2 * LOG(MID);
PROC SORT DATA = INPM;
BY SYS;
PROC STEPWISE;
BY SYS;
MODEL YT = Z1 Z2 Z3/DETAILS;
```

B.3 - Modified Alt 1 Stepwise Regression

This program was used to run the stepwise regression procedure for the Modified Alt 1 formulation.

```
OPTIONS LINESIZE = 80;
DATA INPM;
  INFILE INPM;
INPUT SYS $ LOT QTY AUC MID;
  RATE = QTY;
  RATIO = (QTY/LAG1(QTY)) - 1;
    IF LOT = 1 THEN RATIO = 1;
  YT = LOG(AUC);
  Z1 = LOG(MID);
  Z2 = LOG(QTY);
  Z3 = RATIO * Z2;
  Z4 = RATIO**2 * Z2;
PROC SORT DATA = INPM;
  BY SYS;
PROC STEPWISE;
  BY SYS;
MODEL YT = Z1 Z2 Z3 Z4/DETAILS;
```

B.4 - Modified Alt 2 Stepwise Regression

This program was used to run the stepwise regression procedure for the Modified Alt 2 formulation.

```
OPTIONS LINESIZE = 80;
DATA INPM;
INFILE INPM;
INFUT SYS $ LOT QTY AUC MID;
RATE = QTY;
RATIO = (QTY/LAG1(QTY)) - 1;
IF LOT=1 THEN RATIO = 1;
YT = LOG(AUC);
Z1 = LOG(MID);
Z2 = RATE * Z1;
Z3 = RATE**2 * Z1;
Z4 = RATIO * Z1;
```

```
Z5 = RATIO**2 * Z1;
PROC SORT DATA = INPM;
BY SYS;
PROC STEPWISE;
BY SYS;
MODEL YT = Z1 Z2 Z3 Z4 Z5/DETAILS;
```

B.5 - Modified Alt 3 Stepwise Regression

This program was used to run the stepwise regression procedure for the Modified Alt 3 formulation.

```
OPTIONS LINESIZE = 80;
DATA INPM;
  INFILE INPM;
INPUT SYS $ LOT QTY AUC MID;
  RATE = QTY;
 RATIO = (QTY/LAG1(QTY));
IF LOT = 1 THEN RATIO = 1;
  YT = LOG(AUC);
  Z1 = LOG(MID);
  Z2 = RATIO * Z1;
  Z3 = RATIO**2 * Z1;
PROC SORT DATA = INPM;
 BY SYS;
PROC STEPWISE;
 BY SYS;
MODEL YT = Z1 Z2 Z3 /DETAILS;
```

B.6 Modified Alt 1 Non-linear Regression

This program was used to run the non-linear regression procedure

```
OPTIONS LINESIZE = 80;

DATA INP;

INFILE INP;

INPUT SYS $ LOT QTY AUC;

RETAIN XL 0 XU 0;

IF LOT = 1 THEN XU = 0;

IF LOT > 0 THEN XU + QTY;

XL = XU - QTY;

IF LOT = 1 THEN XL = .0000001;

R = (QTY/LAG1(QTY));

IF LOT = 1 THEN R = 1;

YI = QTY;

TCA = QTY*AUC;

PROC SORT DATA = INP;
```

for the Modified Alt 1 formulation.

```
BY SYS;
PROC NLIN DATA = INP
  METHOD = MARQUARDT
  MAXITER = 100
  CONVERGE = .00000000000000001;
  PARMS A = 1
        B = 0
        C = 0
        D = 0
        \mathbf{E} = 0;
  F1 = (C + (D*R) + (E*R**2) + 1);
  F2 = (XU**(B+1)) - (XL**(B+1));
MODEL TCA = ((A*YI**F1)/(B+1))*F2;
  DER.A = ((YI**F1)/(B+1))*F2;
  DER.B = ((XU**(B+1)*LOG(XU)) - (XL**(B+1)*LOG(XL)))*A*YI**F1/(B+1) -
          ((A*YI**F1*(XU**(B+1) - XL**(B+1)))/(B+1)**2);
  DER.C = (A*YI**F1*LOG(YI)/(B+1))*(XU**(B+1) - XL**(B+1));
  DER.D = (A*YI**F1*LOG(YI)*R/(B+1))*(XU**(B+1)) - XL**(B+1));
  DER.E = ((A*YI**F1*LOG(YI)*R**2)/(B+1))*(XU**(B+1) - XL**(B+1));
BY SYS;
  OUTPUT OUT = NOUT
  PARMS = A0 B0 C0 DO E0
  PREDICTED = TCP
  RESIDUAL = RES;
  DATA OUT2;
  SET NOUT;
    UCP = TCP/QTY;
    DIF = AUC - UCP;
   PCT = 100 * DIF/AUC;
PROC PRINT DATA =OUT2;
  VAR LOT XL XU YI R AUC UCP DIF PCT;
 BY SYS;
```

B.7 - Modified Alt 2 Non-linear Regression

This program was used to run the non-linear regression procedure

for the Modified Alt 2 formulation.

```
OPTIONS LINESIZE = 80;

DATA INP;

INFILE INP;

INPUT SYS $ LOT QTY AUC;

RETAIN XL 0 XU 0 VI 0;

IF LOT = 1 THEN XU = 0;

IF LOT > 0 THEN XU + QTY;

YI = QTY;

XL = XU - QTY;

IF LOT = 1 THEN XL = .0000001;

R = (QTY/LAG1(QTY)) - 1;

IF LOT = 1 THEN R = 1;
```

```
TCA = QTY*AUC;
PROC SORT DATA = INP;
  BY SYS;
PROC NLIN DATA = INP
  METHOD = MARQUARDT
  MAXITER = 100
  CONVERGE = .00000000000000001;
  PARMS A = 1
        B = 0
        C = 0
        D = 0
        \mathbf{E} = \mathbf{0}
        F = 0;
  F1 = (B + (C*R) + (E*YI) + (F*YI**2) + (D*R**2) + 1);
  F2 = (XU**F1-XL**F1);
MODEL TCA= (A/F1)*F2;
  DER.A = (1/F1)*F2;
  DER.B = ((A/F1)*XU**F1*LOG(XU)) - ((A/F1**2)*XU**F1) -
          ((A/F1)*XL**F1*LOG(XL)) + ((A/F1**2)*XL**F1);
  DER.C = ((A/F1)*XU**F1*LOG(XU)*R) - ((A/F1**2)*XU**F1*R) -
          ((A/F1)*XL**F1*LOG(XL)*R) + ((A/F1**2)*XL**F1*R);
  DER.D= ((A/F1)*XU**F1*LOG(XU)*R**2) - ((A/F1**2)*R**2*XU**F1) -
          ((A/F1)*XL**F1*LOG(XL)*R**2) + ((A/F1**2)*R**2*XL**F1);
  DER.E = ((A/F1)*XU**F1*LOG(XU)*YI) - ((A/F1**2)*XU**F1*YI) -
          ((A/F1)*XL**F1*LOG(XL)*YI) + ((A/F1**2)*XL**F1*YI);
  DER.F = ((A/F1)*XU**F1*LOG(XU)*YI**2) - ((A/F1**2)*XU**F1*YI**2) -
          ((A/F1)*XL**F1*LOG(XL)*YI**2) + ((A/F1**2)*XL**F1*YI**2);
  BY SYS;
    OUTPUT OUT = NOUT
    PARMS = A0 B0 C0 D0 E0 F0
    PREDICTED = TCP
    RESIDUAL = RES;
    DATA OUT2;
    SET NOUT;
      UCP = TCP/QTY;
      DIF = AUC - UCP;
      PCT = 100 * DIF/AUC;
PROC PRINT DATA = OUT2;
 VAR LOT XL XU YI R AUC UCP DIF PCT;
 BY SYS;
```

B.8 - Modified Alt 3 Non-linear Regression

This program was used to run the non-linear regression procedure for the Modified Alt 3 formulation.

OPTIONS LINESIZE = 80;

DATA IMP; INFILE IMP; IMPUT SYS \$ LOT QTY AUC;

```
RETAIN XL 0 XU 0 VI 0;
    IF LOT = 1 THEN XU = 0;
    IF LOT > 0 THEN XU + QTY;
      XL = XU - QTY;
    IF LOT = 1 THEN XL = .0000001;
      R = (QTY/LAG1(QTY));
    IF LOT = 1 THEN R = 1;
    TCA = QTY * AUC;
PROC SORT DATA = INP;
  BY SYS;
PROC NLIN DATA = INP
  METHOD = MARQUARDT
 MAXITER = 100
  CONVERGE = .00000000000000001;
  PARMS A = 1
        \mathbf{B} = \mathbf{0}
        C = 0
        D = 0;
    F1 = (B + (C*R) + (D*R**2) + 1);
    F2 = (XU**F1-XL**F1);
MODEL TCA= (A/F1)*F2;
  DER.A = (1/F1)*F2;
  DER.B = ((A/F1)*XU**F1*LOG(XU)) - ((A/F1**2)*XU**F1) -
          ((A/F1)*XL**F1*LOG(XL)) + ((A/F1**2)*XL**F1);
  DER.C = ((A/F1)*XU**F1*LOG(XU)*R) - ((A/F1**2)*XU**F1*R) -
          ((A/F1)*XL**F1*LOG(XL)*R) + ((A/F1**2)*XL**F1*R);
  DER.D = ((A/F1)*XU**F1*LOG(XU)*R**2) - ((A/F1**2)*R**2*XU**F1) -
          ((A/F1)*XL**F1*LOG(XL)*R**2) + ((A/F1**2)*R**2*XL**F1);
BY SYS;
  OUTPUT OUT = NOUT
  PARMS = A0 B0 C0 D0
 PREDICTED = TCP
  RESIDUAL = RES;
  DATA OUT2;
  SET NOUT;
    UCP = TCP/QTY;
    DIF = AUC - UCP;
    PCT = 100 * DIF/AUC;
PROC PRINT DATA = OUT2;
  VAR LOT XL XU R AUC UCP DIF PCT;
  BY SYS;
```

B.9 - Basic Learning Curve Non-linear Regression

This program was used to run the non-linear regression procedure for the Basic Learning Curve formulation.

```
OPTIONS LINESIZE = 80;
DATA INP;
INFILE INP:
```

```
INPUT SYS $ LOT QTY AUC;
  RETAIN XL 0 XU 0 VI 0;
    IF LOT = 1 THEN XU = 0;
    IF LOT > 0 THEN XU + QTY;
      XL = XU - QTY;
    IF LOT = 1 THEN XL = .0000001;
    TCA = QTY * AUC;
PROC SORT DATA = INP;
  BY SYS;
PROC NLIN DATA = INP
  METHOD = MARQUARDT
  MAXITER = 100

    \text{CONVERGE} = .00000000000000001;

  PARMS A = 1
       B = 0;
    F1 = (B + 1);
    F2 = (XU**F1-XL**F1);
MODEL TCA= (A/F1)*F2;
  DER.A = (1/F1)*F2;
  DER.B = ((A/F1)*XU**F1*LOG(XU)) - ((A/F1**2)*XU**F1) -
          ((A/F1)*XL**F1*LOG(XL)) + ((A/F1**2)*XL**F1);
BY SYS;
  OUTPUT OUT = NOUT
  PARMS = A0 B0 C0 D0
  PREDICTED = TOP
  RESIDUAL = RES;
  DATA OUT2;
  SET NOUT;
    UCP = TCP/QTY;
    DIF = AUC - UCP;
    PCT = 100 * DIF/AUC;
PROC PRINT DATA = OUT2;
  VAR LOT XL XU AUC UCP DIF PCT;
  BY SYS;
```

Appendix C: SAS Computer Output Summary

This appendix contains the summary results of the SAS computer runs. The results are summarized by model formulation and program type.

C.1 - Alternative One Stepwise Regression

This section contains the summary results produced by the stepwise procedure in SAS. The SAS program used to produce this run was discussed in Appendix B.1.

C.1.1 - Bomber Aircraft Programs

| | ~ | SYS=B- | 1B | | |
|------------------------------|-----------------------|--|----------------|-----------|------------------|
| RECRESSION ERROR TOTAL | DY SUM 2 2 4 | OF SQUARES 1.47983409 0.00066131 1.48049540 | 0.73991705 | F 2237.75 | PROB>F 0.0004 |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| INTERCEPT | 6.12415495 | | | | |
| | -0.22731519 | 0.03635445 | 0.01292749 | 39.10 | 0.0246 |
| Z2 | -0.10701422 | 0.04649846 | | 5.30 | |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP ENTE | RED REMOVED | IN | | | C(P) |
| 1 21 | | 1 | R**2 0.9984 | 0.9984 | 2.80967 |
| 2 Z 2 | | 2 | | 0.9996 | |
| | VARIA | RLE. | | | |
| ST | ep entered | REMOVED | F | PROB>F | |
| | 1 Z1 | | 1837.8954 | | |
| | 2 22 | | 5.2967 | | |
| | | SYS=B | -52 | | |
| | | | | | |
| | DF SUM | OF SQUARES | MEAN SQUARE | F | PROB>F |
| RECRESSION | 1 | 0.98951441 | 0.98951441 | 10.54 | 0.0118 |
| ERROR | 8 9 | 0.75101711 | 0.09387714 | l | |
| TOTAL | 9 | 1.74053152 | | | |
| | | | | | |
| INTERCEPT | B VALUE 4.66879195 | STO ERROR | TYPE II SS | F | PROB>F |

| STEP 1 | ENTE Z1 | VARIABLE RED REMO ¹ | | NUMBER IN 1 | PARTIAL R**2 0.5685 | MOI R* 0.56 | EL **2 585 | C(P) 0.81960 |
|------------|------------------|-----------------------------------|--------|-------------------|---------------------------|-------------------|------------------|---|
| | | | | SYS=B- | -58 | | | |
| | | | | | | | | |
| NO VA | RIABLE | S MET THE 0 | .1500 | SIGNIFICAN | NCE LEVEL FO | R ENTRY | INTO T | HE MODEL. |
| | | | | | | | | |
| C.1.2 | - Fig | hter Aircra | ft Pro | ograms | | | | |
| | | | | SYS≃A- | -10 | | | |
| | | | | | | | | |
| | | | SUM (| OF SQUARES | Mean squ | ARE | F | PROB>F |
| RECRES | SSION | 1 7 | | | 0.20697 | | 8.93 | 0.0203 |
| ERROR | | | | | 0.02316 | 723 | | |
| TOTAL | | 8 | (| 0.36914658 | | | | |
| | | B VALU | Ξ | STD ERROR | TYPE II | SS | F | PROB>F |
| INTER | EPT | 2.9806253 | | | | | | |
| Z 2 | _ | -0.1858505 | | 0.06217860 | 0.20697 | 599 | 8.93 | 0.0203 |
| | | WADTARI.E | | NI IMPRED | PARTIAL | MOL | ज. | |
| CHILD | นากเก | RED REMOV | | | R**2 | | | C(P) |
| 1 | Z2 | | 4 LLL | | 0.5607 | | | |
| _ | | | | _ | | | | |
| | | | | SYS=F-1 | L00 | | | |
| | | DF | SUM C | OF SQUARES | MEAN SQU | ARE | F | PROB>F |
| REGRES | SSION | | (| 0.51333658 | 0.51333 | 658 | 95.15 | 0.0023 |
| ERROR | | 3 | (| 0.01618481 | 0.00539 | 494 | | |
| TOTAL | | 4 | (| 0.52952138 | | | | |
| | | B VALU | 2 | STD ERROR | TYPE II | SS | F | PROB>F |
| INTERC | EPT | 2.18648143 | | | | | • | • |
| 21 | | -0.15830979 | | 0.01622930 | 0.51333 | 558 | 95.15 | 0.0023 |
| | | VARIABLE | | NUMBER | PARTIAL | MOD | iot | |
| STEP | ENTE | | TFT) | IN | R**2 | R* | | C(P) |
| 1 | | | | 1 | 0.9694 | | | 0.42939 |
| - | U _ | | | _ | | | • | • |
| | | | | SYS=F-1 | .01 | | | |
| | | DF | SUM C | F SQUARES | MEAN SQUA | ARE | F | PROB>F |
| REGRES | SSION | 1 | 0 | .92472428 | 0.92472 | 128 | 69.59 | |
| ERROR | | 4 | | .05315185 | 0.01328 | 796 | | |
| TOTAL | | 5 | C | .97787613 | | | | |
| | | B VALUE | 7. | STD ERROR | TYPE II | SS | F | PROB>F |
| INTERC | EP T | 3.32628329 | | DID ERWOR | AAEG II | 50 | ľ | LIGHT |
| 21 | - - - | -0.25635237 | | .03072985 | 0.92472 | 128 | 69.59 | 0.0011 |
| | | | _ | | · | - | | |

| STEP 1 | Z1 | RED | REMOVE |) 1 | N 1 | PARTIAL R**2 0.9456 | 0 | R**2 .9456 | |
|--------------------------|------------|-------------------|--------------------|--|------------|--------------------------------|----------------------|----------------------|------------------|
| REGRES ERROR TOTAL | SSION | DE 1 | r su L | | RES 506 | MEAN SQL 1.45937 0.01551 | J ARE 7506 | | |
| TAMOOO | ACMUM. | 2 20 | VALUE | STD ER | ROR | TYPE II | SS | F | PROB>F |
| Z1 | ACAP I | -0.37 | 9652787 7709990 | 0.03888 | 328 | 1.45937 | 7506 | 94.06 | 0.0105 |
| STEP 1 | ENTE Z1 | VARIA RED | ABLE REMOVED | NUMBE I | N | PARTIAL R**2 0.9792 | | R**2 | C(P) |
| | | | | SYS | =F-10 | 6 | | | |
| REGRES ERROR TOTAL | SSION | DF 1 2 3 | su : | M OF SQUA 1.19964 0.07824 1.27789 | 803 | MEAN SQU 1.19964 0.03912 | JARE 1727 2402 | F 30.66 | PROB>F 0.0311 |
| INTERC | EPT | 4.79 | VALUE 1595764 | STD ER | ROR | TYPE II | SS | F | PROB>F |
| Z1 | | -0.49 | 884822 | 0.09008 | 726 | 1.19964 | 727 | 30.66 | 0.0311 |
| STEP 1 | ENTE Z1 | | BLE REMOVED | | N | PARTIAL R**2 0.9388 | | R**2 | C(P) |
| | | | | SYS: | =F-15 | AB | | | |
| REGRES ERROR TOTAL | SION | | | | 233 943 | MEAN SQU 0.15260 0.00104 | 233 | | |
| INTERC | EPT | 3.52 | VALUE 762254 | STD ER | | TYPE II | | F | PROB>F |
| Z1 | | -0.13 | 148161 | 0.010879 | 959 | 0.15260 | 233 | 146.05 | 0.0003 |
| STEP | ENTE Z1 | VARIA RED | BLE REMOVED | | | PARTIAL R**2 0.9733 | | ODEL R**2 9733 | C(P) 0.53578 |

| | | SYS=F-1 | 5CD | | |
|---------------------|-----------------------|--|--------------|---|---------|
| RECRESSION ERROR | DF SUM 2 5 | OF SQUARES 0.09702437 0.02322933 | | 18 10.44 | |
| TOTAL | 7 | 0.12025370 | | | |
| T አነጥፍው/"ፍውጥ | B VALUE 3.88769141 | STD ERROR | TYPE II | SS F | PROB>F |
| Z2 | -0.24027715 | 0.06904562 | 0.056262 | 55 12.11 | 0.0177 |
| Z3 | 0.35007163 | 0.12433319 | | 40 7.93 | 0.0373 |
| | | | | | |
| | VARIABLE | NUMBER | | | 2(5) |
| | ERED REMOVED | IN | | R**2 | |
| 1 Z2 | | 1 | | 0.5006 | |
| 2 Z3 | | 2 | 0.3063 | 0.8068 | 3.6805 |
| | VARIA | BLE. | | | |
| S | | REMOVED | F | PROB>F | |
| J | 1 Z2 | (0.012) | 6.0134 | 0.0496 | |
| | 2 Z 3 | | 7.9276 | 0.0373 | |
| | 2 20 | | | *************************************** | |
| | | sys=F-1 | 5E | | |
| | | | | | |
| | | OF SQUARES | | | |
| REGRESSION | | 0.03658110 | | 10 14.86 | 0.0182 |
| ERROR | 4 | 0.00984798 | 0.002461 | 99 | |
| TOTAL | 5 | 0.04642908 | | | |
| | B VALUE | STD ERROR | TYPE II | SS F | PROB>F |
| INTERCEPT | 4.74308354 | | | | |
| Z 2 | -0.41938638 | 0.10880016 | 0.036581 | 10 14.86 | 0.0182 |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP ENT | ERED REMOVED | IN | R**2 | R**2 | C(P) |
| 1 22 | | 1 | | 0.7879 | 0.62789 |
| | | | | | |
| | | SYS=F-1 | 6AB | | |
| | DD 01.04 | 00.000.000 | VED N. COLLD | DD D | 220272 |
| | | OF SQUARES | MEAN SQUAL | RE F | |
| REGRESSION | | 0.28836638 | | 38 10.64 | 0.0471 |
| ERROR | 3 | 0.08130971 | 0.027103 | 24 | |
| TOTAL | 4 | 0.36967609 | | | |
| | B VALUE | STD ERROR | TYPE II | SS F | PROB>F |
| INTERCEPT | 3.18677898 | | | | |
| Z1 | -0.22828275 | 0.06998603 | 0.288366 | 38 10.64 | 0.0471 |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP ENT | ERED REMOVED | IN | R**2 | R**2 | C(P) |
| 1 21 | | 1 | 0.7801 | | 0.44534 |
| | | - | JJ. | | |

NO VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL. C.1.3 - Electronics Programs DF SUM OF SQUARES MEAN SQUARE F PROB>F
1 0.16857539 0.16857539 17.20 0.0255 1 REGRESSION ERROR 3 0.02940906 0.00980302 4 0.19798445 TOTAL B VALUE STD ERROR TYPE II SS F PROB>F INTERCEPT -2.85965214 -0.13022074 0.03140241 0.16857539 17.20 0.0255 **Z**2 VARIABLE NUMBER PARTIAL MODEL R**2 R**2 C(P) 0.8515 0.8515 0.06968 STEP ENTERED REMOVED IN 1 1 Z2 DF SUM OF SQUARES MEAN SQUARE F PROB>F
1 0.11782452 0.11782452 69.37 0.0004
5 0.00849241 0.00169848 REGRESSION 1 ERROR TOTAL 6 0.12631693 B VALUE STD ERROR TYPE II SS F PROB>F INTERCEPT -3.18672110 -0.12274020 0.01473668 0.11782452 69.37 0.0004 VARIABLE NUMBER PARTIAL MODEL
RED REMOVED IN R**2 R**2
1 0.9328 0.9328 STEP ENTERED REMOVED C(P) -----SYS=ASN-63------NO VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

F PROB>F DF SUM OF SQUARES MEAN SQUARE 0.02259868 REGRESSION 8.17 0.0289 1 0.02259868 6 0.01660517 ERROR 0.00276753 TOTAL 7 0.03920385 B VALUE STD ERROR TYPE II SS F PROB>F INTERCEPT -3.14533001 -0.04210252 0.01473373 0.02259868 8.17 0.0289 **Z2**

| 1 72 | VARIABLE TERED REMOVED | IN 1 | 0.5764 | R**2 0.5764 | C(P) 1.19724 |
|------------------------------|--|--|---|----------------|------------------|
| * | | SYS=ASN | -99 | | |
| | DF SUM | 1 of squares | MEAN SQUARE | F | PROB>F |
| RECRESSION ERROR TOTAL | | | 0.12886272 0.01243547 | | 0.0167 |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| INTERCEPT 22 23 | -1.47293904 -0.31785019 0.16225714 | 0.06985813 0.05367918 | 0.25743834 0.11362084 | 20.70 9.14 | |
| STEP EN. 1 Z2 2 Z3 | VARIABLE TERED REMOVED | IN | PARTIAL R**2 0.4505 0.3552 | R**2 0.4505 | 8.07121 |
| | VARIA | ABLE | | | |
| \$ | TEP ENTERED 1 Z2 2 Z3 | REMOVED | F 4.9183 9.1368 | 0.0684 | |
| ~~~~~ | | SYS=ASN- | 108 | | |
| REGRESSION ERROR TOTAL | 1 3 | 0.11931741 | MEAN SQUARE 0.11931741 0.00782823 | F 15.24 | PROB>F 0.0298 |
| INTERCEPT | B VALUE -1.91448159 | STD ERROR | TYPE II SS | F | PROB>F |
| 21 | -0.09411975 | | 0.11931741 PARTIAL R**2 0.8355 | MODEL R**2 | C(P) |
| | | | | | |
| | | SYS=ASQ- | 133 | | |
| RECRESSION ERROR TOTAL | DF SUM 1 1 4 5 | OF SQUARES 0.27102133 0.03360165 0.30462298 | MEAN SQUARE 0.27102133 0.00840041 | 32.26 | PROB>F 0.0047 |
| | | STD ERROR | TYPE II SS | F | PROB>F |
| INTERCEPT 21 | -0.21450800 -0.15053337 | 0.02650217 | 0.27102133 | 32.26 | 0.0047 |

| STEP 1 | ENTE Z1 | VARIABLE ERED REMOVED | IN 1 | R**2 0.8897 | R**2 0.8897 | |
|--------------------------|------------------|---|--|---|-----------------------------------|---------------------------|
| | | | SYS=ASW | -32 | | |
| REGRES ERROR TOTAL | SSION | DF SUM 1 4 5 | OF SQUARES 0.21856871 0.17379957 0.39236828 | MEAN SQUAR 0.2185687 0.0434498 | E F 1 5.03 | PROB>F 0.0883 |
| TARRESO | viorodi) | B VALUE | STD ERROR | TYPE II S | s F | PROB>F |
| | | -1.32228292 -0.14043494 | 0.06261459 | 0.2185687 | 1 5.03 | 0.0883 |
| STEP 1 | Z1 | VARIABLE RED REMOVED | IN 1 | R**2 0.5570 | R**2 0.5570 | 0.21113 |
| | | | SYS=CP-1 | 035 N | | |
| RECRES ERROR TOTAL | SION | 1 4 | OF SQUARES 0.05792215 0.03789921 0.09582136 | 0.0579221 | E F 5 6.11 0 | PROB>F 0.0688 |
| ו איזייניא נ | ייטיעי | B VALUE -2.03789151 | STD ERROR | TYPE II SS | 5 F | PROB>F |
| Z3 | | -0.31162836 | 0.12603747 | 0.05792215 | 6.11 | 0.0688 |
| STEP 1 | Z 3 | VARIABLE RED REMOVED | IN 1 | R**2 0.6045 | R**2 0.6045 | 3.10786 |
| | | | SYS=JTI |)S | | |
| REGRES ERROR TOTAL | SION | | OF SQUARES 0.24230749 0.00004580 0.24235329 | MEAN SQUARE 0.12115375 0.00002290 | 5 5290.21 | PROB>F 0.(J02 |
| Thurs o | mm m | B VALUE | STO ERROR | TYPE II SS | 5 F | PROB>F |
| INTERC Z1 Z3 | :EE-1' | -0.33401008 -0.20897458 -0.05562741 | 0.00209788 0.00885443 | 0.22724228 0.00090390 | | 0.0001 0.0244 |
| STEP 1 2 | ENTE Z1 Z3 | VARIAFT; RED ŁMOVED | NUMBER IN 1 2 | PARTIAL R**2 0.9961 0.0037 | MODEL R**2 0.9961 0.9998 | C(P) 23.9601 2.2038 |

VARIABLE

| | | | | RIA | | | | | |
|--|-----------|-----|------------|-------|------------|--------------------|-------------|----------|---|
| | ST | EΡ | ENTERED |) | REMOVED | F | | PROB>F | |
| | | 1 | Z1 | | | 762.5651 | | 0.0001 | |
| | | 2 | Z 3 | | | 39.4690 | | 0.0244 | |
| | | _ | | | | | | | |
| | | | | | SYS=LA | NNAV | | | |
| | | | DF | SUM | OF SQUARES | MEAN SO | UARE | F | PROB>F |
| REGRES | SSION | | 1 | | 0.40052225 | 0.4005 | 2225 | 40204.49 | 0.0001 |
| ERROR | | | 5 | | 0.00004981 | 0.0000 | 0996 | | • |
| TOTAL | | | 6 | | 0.40057206 | | | | |
| | | | D WATER | , | and bobbon | mann T | T 00 | 17 | DDOD\ R |
| T MITTERS (| מוכוביי | | 64554446 | | SID ERROR | TYPE I | 1 22 | r | PROB>F |
| Z1 | | | | | 0 00060945 | 0.4005 | 2225 | 40204 49 | 0.0001 |
| 21 | | -0. | 12220011 | | 0.00000343 | 0.4005 | <i>LLLJ</i> | 40204.43 | 0.0001 |
| | | VAR | IABLE | | NUMBER | PARTIAL | | MODEL | |
| STEP | ENTE | RED | REMOV | ED | | R**2 0.9999 | | R**2 | C(P) |
| 1 | Z1 | | | | 1 | 0.9999 | 0 | .9999 | 137.757 |
| | | | | | QVQ_T. AN | TARP | | | |
| | | | | | DID-DAI | IMIC | | | |
| | | | DF | SUM | OF SQUARES | MEAN SQ | UARE | F | PROB>F |
| REGRES | SSION | | 3 | | 0.32598971 | 0.1086 | 6324 | 52951.22 | 0.0001 |
| REGRES ERROR TOTAL | | | 3 | | 0.00000616 | 0.10866 0.00000 | 0205 | | |
| TOTAL | | | 6 | | 0.32599587 | | | | |
| | | | B VALUE | | STD ERROR | TYPE II | I SS | F | PROB>F |
| INTERC | EPT | | 44676552 | | | | | - | |
| Z1 | | -0. | 10450506 | | 0.00138309 | 0.01171 | 1607 | 5709.20 | 0.0001 |
| Z2 | | -0. | 00808155 | | 0.00204500 | 0.00003 | 3205 | 15.62 | 0.0289 |
| Z 3 | | 0. | 00942504 | | 0.00105858 | 0.00016 | 5268 | 79.27 | 0.0030 |
| | | VAR | TARLE | | NUMBER | PARTIAL | | MODET. | |
| STEP | HTM: | | | | | R**2 | | | C(P) |
| 1 | Z1 | | 1010 | | 1 | 0.9994 | n | 9994 | 96 9632 |
| 2 | Z3 | | | | 2 | 0.0005 | 0 | .9999 | 17 6171 |
| 3 | | | | | | 0.0001 | | | |
| | | | | | | | | | |
| | am. | | | RIA | | | | | |
| | ST | _ | ENTERED | | REMOVED | F | | PROB>F | |
| | | 1 | 21 | | | 7940.7559 | | 0.0001 | |
| | | 2 | 23 | | | 17.4777 | | 0.0139 | |
| | | 3 | Z 2 | | | 15.6171 | | 0.0289 | |
| | | | | | sys=lan | TREC | | | |
| | | | מס | a, e. | 00.000 | 1,000 | | _ | mm == : = |
| רו איייייייייייייייייייייייייייייייייייי | CT CN | | | SUM | OF SQUARES | MEAN SQU | | F | PROB>F |
| REGRES | STON | | 1 | | 0.14785176 | 0.14785 | | 758.78 | 0.0001 |
| ERROR | | | 3 | | 0.00058456 | 0.00019 | 485 | | |
| TOTAL | | | 4 | | 0.14843632 | | | | |

| INTERCEPT | B VALUE -0.34649331 | STD ERROR | TYPE II SS | F F | PROB>F |
|-------------|------------------------|-------------|--------------|----------------|-----------------|
| Z1 | | 0.00528443 | 0.14785176 | 758.78 | 0.0001 |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP ENTE | | | R**2 | R**2 | C(P) |
| 1 21 | | 1 | 0.9961 | 0.9961 | 0.94033 |
| ± | | | | | |
| | | | | | |
| C.1.4 - Hel | icopter Program | S | | | |
| | | | | | |
| | | SYS=HH- | 52 | | |
| | | | | | |
| | | OF SQUARES | mean square | E F | PROB>F |
| REGRESSION | | 0.12412828 | | 38.92 | 0.0034 |
| ERROR | 4 | 0.01275667 | 0.0031891 | 7 | |
| TOTAL | 5 | 0.13688495 | | | |
| | | | | | |
| | B VALUE | STD ERROR | TYPE II S | 5 F | PROB>F |
| INTERCEPT | 0.83324089 | | | | |
| Z1 | -0.18605919 | 0.02982321 | 0.12412828 | 38.92 | 0.0034 |
| | | | | | |
| | VARIABLE | | PARTIAL | | G(D) |
| | ERED REMOVED | IN | R**2 | - | C(P) 25.0699 |
| 1 Z1 | | 1 | 0.9068 | 0.9068 | 25.0633 |
| | | רער-יינו | 16 | | |
| | | 515-CH- | 40 | | |
| | DF SUM | OF SQUARES | MEAN SOLIARI | न इ | PROB>F |
| REGRESSION | 2 | 1.26216747 | 0 63108374 | E F 4 75.38 | 0.0002 |
| | | 0.04186031 | 0.00837206 | | 010002 |
| ERROR | 3 7 | 1.30402778 | 0.0003720 | • | |
| TOTAL | , | 1.30402770 | | | |
| | B VALUE | STD ERROR | TYPE II S | s f | PROB>F |
| INTERCEPT | 2.91405691 | DID DUION | 1112 11 21 | _ | |
| Z1 | -0.12800003 | 0.03385284 | 0.11969126 | 5 14.30 | 0.0129 |
| Z2 Z2 | -0.29649699 | 0.07233527 | 0.14066073 | | 0.0094 |
| 44 | -0.23043033 | 0.07233327 | 0.1100007 | 20.00 | 3,433 |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP ENTE | ERED REMOVED | IN | R**2 | R**2 | C(P) |
| 1 22 | 200 10210120 | 1 | 0.8761 | 0.8761 | 13.5478 |
| 2 Z1 | | 2 | 0.0918 | 0.9679 | 2.5469 |
| | | _ | | - | |
| | VARIA | BLE | | | |
| Sf | TEP ENTERED | REMOVED | F | PROB>F | |
| <u> </u> | 1 Z2 | | 42.4314 | 0.0006 | |
| | 2 Z1 | | 14.2965 | 0.0129 | |
| | = | | | | |

| | | | | SYS=H- | -53 | | | |
|------------|------------|-----------------|--------------|--|--------------|-------|-------|---------|
| | | DF | SUM | OF SQUARES | MEAN SQU | ARE | F | PROB>F |
| REGRES | SSION | 1 | | OF SQUARES 0.36413891 | 0.36413 | 891 | 56.37 | 0.0003 |
| ERROR | | 6 | | 0.03876051 | 0.00646 | 008 | | |
| TOTAL | | 7 | | 0.40289942 | | | | |
| INTER | EPT | B VA 2.07266 | LUE 030 | STD ERROR | TYPE II | SS | F | PROB>F |
| 21 | | -0.14183 | 982 | 0.01889225 | 0.36413 | 891 | 56.37 | 0.0003 |
| | | VARIABLE | | NUMBER IN 1 | PARTIAL | MODE | ĭL | |
| STEP | ENTE | RED RE | MOVED | IN | R**2 | R** | 2 | C(P) |
| 1 | 21 | | | 1 | 0.9038 | 0.903 | 88 | 0.13053 |
| | | | | sys=ch- | 47 | | | |
| | | DF | SUM | OF SOUARES | MEAN SOU | ARE | F | PROB>F |
| REGRES | SSION | 2 | | 0.95253232 | 0.47626 | 616 | 43.60 | 0.0001 |
| ERROR | | 9 | | 0.09832239 | 0.01092 | 471 | | |
| TOTAL | | 11 | | OF SQUARES 0.95253232 0.09832239 1.05085471 | | | | |
| | | B VA | LUE | STD ERROR | TYPE II | SS | F | PROB>F |
| INTERC | EPT | 2.68400 | 939 | | | | | |
| | | | | 0.02135363 | | | | |
| Z 2 | | -0.22206 | 813 | 0.03636441 | 0.40740 | 777 | 37.29 | 0.0002 |
| | | VARIABLE | | NUMBER | PARTIAL | MODE | L | |
| STEP | ENTE | red rei | 10VED | IN 1 | R**2 | R** | 2 | C(P) |
| 1 | Z2 | | | 1 | 0.5875 | 0.587 | 5 | 27.3173 |
| 2 | Z1 | | | 2 | 0.3189 | 0.906 | 4 | 2.0106 |
| | | | VARIA | BLE | | | | |
| | ST | ep ente | SED CER | REMOVED | F 14.2419 | P | ROB>F | |
| | | 1 22 | | | 14.2419 | 0 | .0036 | |
| | | 2 Z1 | | | 30.6796 | 0 | .0004 | |
| | | | | SYS=H- | 54 | | | |
| | | DF | SUM | OF SQUARES | MEAN SQU | ARE | F | PROB>F |
| REGRES | SION | 1 | | 0.18000333 | 0.18000 | | 10.45 | 0.0481 |
| ERROR | | 3 | | 0.05167528 | 0.01722 | | 200.0 | 0.0.01 |
| TOTAL | | 4 | | 0.23167861 | | | | |
| | | B VAI | UE | STD ERROR | TYPE II | SS | F | PROB>F |
| INTERC | EPT | 1.762041 | L 33 | | | | | |
| Z1 | | -0.154474 | 184 | 0.04778574 | 0.180003 | 333 | 10.45 | 0.0481 |
| | | VARIABLE | | NUMBER | PARTIAL | MODE | | |
| STEP | ENTE | RED REM | 10VED | IN | R**2 | R** | 2 | C(P) |
| 1 | Z1 | | | 1 | 0.7770 | 0.777 | 0 | 0.76561 |

| | | | | | SYS=HH | -60D | | | |
|---------------------------|------------------------|--------------|------------------------------|--------|--|---|--------------|--|------------------|
| RECRES ERROR TOTAL | SION | Γ |)F 3 0 3 | | OF SQUARES 0.07173034 0.00000000 0.07173034 | 0.0239 | 1011 | F 99999.99 | PROB>F 0.0001 |
| T NATION | ED# | | B VALU 1979186 | | STD ERROR | TYPE I | I SS | F | PROB>F |
| Z1 Z2 Z3 | | -0.0 -0.0 | 551857: 512822! 101390 | L 5 | 0 0 0 | | 7748 | 99999.99 99999.99 99999.99 | 0.0001 |
| STEP 1 2 3 | ENTE Z2 Z1 Z3 | | ABLE REMOV | | NUMBER IN 1 2 3 | PARTIAL R**2 0.9785 0.0207 0.0008 | 0 | MODEL R**2 .9785 .9992 .0000 | C(P) |
| | | | V | RIA | BLE | | | | |
| | ST | 1 2 | | | REMOVED | 91.1672 27.2272 9999.9999 | | PROB>F 0.0108 0.1205 0.0001 | |
| | | | | | SYS=SI | {-3 | | | |
| RFGRES: ERROR TOTAL | SION | | F 1 7 8 | | OF SQUARES 0.32143167 0.09147543 0.41290709 | 0.32143 | 3167 | F 24.60 | |
| T NITTETO (*T | 250TP | | B VALUE 9416647 | | STD ERROR | TYPE I | ı ss | F | PROB>F |
| Z1 | 2 2 1 | | | | 0.03187031 | 0.32143 | 3167 | 24.60 | 0.0016 |
| STEP 1 | ENTER 21 | VARI. RED | ABLE REMOV | ED | NUMBER IN 1 | PARTIAL R**2 0.7785 | | MODEL R**2 .7785 | C(P) 0.32533 |
| <u>C.1.5</u> - | - Tact | ical | Armame | nt P | rograms | | | | |
| | | | | | SYS=LLL | GB | | | |
| REGRESS ERROR TOTAL | SION | | | SUM | OF SQUARES 0.71772163 0.00152979 0.71925142 | MEAN SQL 0.71772 | JARE 2163 | | PROB>F |

| | | B VALUE | STD ERROR | TYPE II SS | 5 F | PROB>F |
|------------------|------------|----------------------------|--------------------------|---------------------------|---------|---------|
| Z1 | FF.I. | -2.51061063 -0.17034813 | 0.00278055 | 0.71772163 | 3753.30 | 0.0001 |
| STEP | ENTE | VARIABLE RED REMOVED | | PARTIAL R**2 | | C(P) |
| 1 | 21 | | | 0.9979 | | |
| | | | SYS=CE | M | | |
| | | DE CIR | OF COUNTRY | MENN COUNTRY | . 5 | DDOD) D |
| REGRES | SION | | OF SQUARES 2.32168009 | MEAN SQUARE 2.32168009 | | |
| FPROR | | | | 0.01244153 | | 0.0001 |
| 'I JI'AL | | | 2.39632925 | | | |
| T NOTES CO | arDar | B VALUE -1.29953645 | STD ERROR | TYPE II SS | F | PROB>F |
| Z2 | | | 0.02109748 | 2.32168009 | 186.61 | 0.0001 |
| | | VARIABLE | NUMBER | PARTIAL | MODEL | |
| | | RED REMOVED | IN | R**2 0.9688 | R**2 | C(P) |
| 1 | Z 2 | | 1 | 0.9688 | 0.9688 | 19.5040 |
| | | | SYS=GBU- | -15 | | |
| | | DF SUM | OF SOUNDES | MEAN SQUARE | ធ | DPOB\F |
| RECRESS | SION | 1 | 0.09760238 | 0.09760238 | 8.61 | 0.0219 |
| REGRESS ERROR | | 7 | 0.07931718 | 0.01133103 | ***** | 0.0223 |
| TOTAL | | 8 | 0.17691956 | | | |
| INTERCE | ær | B VALUE -1.23612677 | STD ERROR | TYPE II SS | F | PROB>F |
| | | -0.10838260 | 0.03692870 | 0.09760238 | 8.61 | 0.0219 |
| | | | | PARTIAL | | |
| | | RED REMOVED | | R**2 | | |
| 1 | Z 2 | | 1 | 0.5517 | 0.5517 | 0.04778 |
| <u>C.1.6</u> - | - Taci | tical Missile Pr | rograms | | | |
| | | | SYS=AMRA | AM | | |
| | | | | | | |
| DECEMBER | 17.011 | | OF SQUARES | MEAN SQUARE | F | |
| REGRESS ERROR | TON | 1 | 3.86655114 | | 7317.93 | 0.0001 |
| TOTAL | | 8 9 | 0.00422694 3.87077808 | 0.00052837 | | |
| TOTAL | | 3 | 3.0/0//000 | | | |
| 71,000 | *D | B VALUE | STO ERROR | TYPE II SS | F | PROB>F |
| Z1 | Æ-1. | 1.68243228 -0.35610306 | 0.00416276 | 3.86655114 | 7317.93 | 0.0001 |

| STEP 1 | ENTE Z1 | | RIABLE REMOVED | NUMBER IN 1 | PARTIAL R**2 0.9989 | MODEL R**2 0.9989 | C(P) 0.66469 |
|---------------------------|------------------------|------------------------|-------------------------------------|--|---|---|---|
| | | | | SYS=HA | IRM | | |
| RECRES ERROR TOTAL | SION | | DF SUM 2 8 10 | OF SQUARES 2.42845988 0.00447246 2.43293234 | MEAN SQU 1.21422 0.00055 | 994 2171.92 | |
| | | | B VALUE | STD ERROR | TYPE II | SS F | PROB>F |
| INTERC Z1 Z2 | EPT | -0. | .93266880 .16383163 .13846115 | 0.01057877 0.01818247 | 0.13408 0.03241 | | |
| STEP 1 2 | ENTE Z1 Z2 | | RIABLE REMOVED | NUMBER IN 1 2 | PARTIAL R**2 0.9848 0.0133 | MODEL R**2 0.9848 0.9982 | C(P) 50.7702 2.0036 |
| | | | VARIA | BLE | | | |
| | ST | EP 1 2 | ENTERED Z1 Z2 | REMOVED | F 584.5267 57.9896 | PROB>F 0.0001 0.0001 | |
| | | | | SYS=II | R | | |
| REGRESS ERROR TOTAL | SION | | DF SUM 2 6 8 | OF SQUARES 2.66443838 0.03684343 2.70128181 | MEAN SQUA 1.332219 0.006140 | 216.95 | PROB>F 0.0001 |
| | | • | B VALUE | STD ERROR | TYPE II | SS F | PROB>F |
| INTERCI Z1 Z3 | EP'I' | -0. -0. | 01993208 27368702 19600006 | 0.01359177 0.04731759 | 2.489802 0.105360 | 17.16 | 0.0001 0.0061 |
| STEP 1 2 3 4 | ENTE Z2 Z1 Z3 | | REMOVED Z2 | NUMBER IN 1 2 3 2 | PARTIAL R**2 0.9569 0.0142 0.0169 0.0016 | MODEL R**2 0.9569 0.9711 0.9880 0.9864 | C(P) 12.9577 9.0447 4.0000 2.6876 |
| | | | VARIAE | BLE | | | |
| | ST | EP 1 2 3 4 | ENTERED 22 21 23 | REMOVED | F 155.5503 2.9455 7.0447 0.6876 | PROB>F 0.0001 0.1369 0.0452 0.4447 | |

| | | sys=air | 17F-R | | |
|-----------------------------|----------------------------|--|---|-----------------------------------|----------------------------|
| | DF | SUM OF SQUARES | MEAN SQUARE | F | PROB>F |
| REGRESSIC ERROR TOTAL | ON 2 5 7 | 3.46010800 0.01479983 3.47490783 | 0.00295997 | | 0.0001 |
| INTERCEPT | B VALUE 1.70702999 | | TYPE II SS | F | PROB>F |
| Z1 Z2 | -0.28922188 -0.21517373 | 0.04392532 | 0.12832732 0.01930102 | 43.35 6.52 | 0.0012 0.0510 |
| STEP EN 1 21 2 22 | | NUMBER FED IN 1 2 | | MODEL R**2 0.9902 0.9957 | C(P) 6.43688 2.52962 |
| | VA | RIABLE | | | |
| | STEP ENTERED 1 Z1 2 Z2 | | F 605.4055 6.5207 | PROB>F 0.0001 0.0510 | |
| ~ | | SYS=AIM7 | F-GD | | |
| RECRESSIO ERROR TOTAL | | SUM OF SQUARES 5.01319984 0.02441606 5.03751591 | MEAN SQUARE 2.50659992 0.00813869 | F 307.99 | PROB>F 0.0003 |
| INTERCEPT | | | TYPE II SS | F | PROB>F |
| Z1 Z3 | -0.45127619 -0.16801516 | 0.01913489 0.06242494 | 4.52675705 0.05895695 | 556.20 7.24 | 0.0002 0.0743 |
| STEP EN 1 Z1 2 Z3 | | NUMBER ED IN 1 2 | R**2 0.9834 0 | MODEL R**2 0.9834 0.9952 | C(P) 8.45841 3.06278 |

C.2 - Alternacive Two Stepwise Regression

This section contains the summary results produced by the stepwise regression procedure in SAS. The SAS program used to produce this run was discussed in Appendix B.2.

C.2.1 - Bomber Aircraft Programs

| | | SYS=B- | 1B | | |
|------------------------------|--------------------------------------|--|---|---------------|------------------|
| RECRESSION ERROR TOTAL | DF SUM 1 3 4 | OF SQUARES 1.47808272 0.00241268 1.48049540 | MEAN SQUARE 1.47808272 0.00080423 | F 1837.90 | PROB>F 0.0001 |
| INTERCEPT | B VALUE 6.06180789 | STD ERROR | TYPE II SS | F | PROB>F |
| Z1 | -0.31029881 | 0.00723802 | 1.47808272 | 1837.90 | 0.0001 |
| STEP ENTE | VARIABLE RED REMOVED | NUMBER IN 1 | PARTIAL R**2 | MODEL R**2 | C(P) |
| 1 41 | | - | 0,5504 | 0.5504 | 0.00505 |
| | | SYS=B- | 52 | | |
| RECRESSION ERROR TOTAL | DF SUM 1 8 9 | OF SQUARES 0.98951441 0.75101711 1.74053152 | MEAN SQUARE 0.98951441 0.09387714 | F 10.54 | PROB>F 0.0118 |
| INTERCEPT | B VALUE 4.66879195 -0.21690646 | | TYPE II SS | | |
| | VARIABLE RED REMOVED | NUMBER IN | וא זייים גרו | MODEL R**2 | C(P) |
| | | SYS=B- | 58 | | |
| | S MET THE 0.1500 | | | | |
| C.2.2 - Fig | hter Aircraft P | rograms | | | |
| | | SYS=A- | 10 | | |
| RECRESSION ERROR TOTAL | DF SUM 1 7 8 | OF SQUARES 0.18748236 0.18166422 0.36914658 | MEAN SQUARE 0.18748236 0.02595203 | | PROB>F 0.0312 |
| INTERCEPT Z2 | B VALUE 2.41566916 -0.00043912 | STD ERROR 0.00016338 | TYPE II SS 0.18748236 | F 7.22 | PROB>F 0.0312 |

| STEP | ENTE 22 | Variable RED REMO | | Number In 1 | PARTIAL R**2 0.5079 | | 10DEL R**2 .5079 | C(P) 0.74678 |
|-----------|------------|----------------------|-------|-------------------|---------------------------|------------|------------------------|-----------------|
| | | | | SYS=F-1 | .00 | | | |
| | | | | | | | _ | |
| REGRES | CTON | DF 1 | SUM | OF SQUARES | MEAN SQUA 0.51333 | ARE CEO | F 05 15 | PROB>F |
| ERROR | STOM | <u>1</u> 3 | | 0.01618481 | 0.00539 | | 33.13 | 0.0023 |
| TOTAL | | 4 | | 0.52952138 | 0.00335 | 424 | | |
| | | | | | | | | |
| | | B VALU | | STD ERROR | TYPE II | SS | F | PROB>F |
| | | 2.1864814 | | 0.01622020 | 0 51222 | CE0 | 05 15 | 0 0000 |
| Z1 | | -0.1583097 | 9 | 0.01622930 | 0.51333 | 658 | 95.15 | 0.0023 |
| | | | | | PARTIAL | | | |
| | | red remo | VED | | R**2 | | | |
| 1 | Z1 | | | 1 | 0.9694 | 0. | 9694 | 0.11265 |
| | | | | SYS=F-1 | .01 | | | |
| | | | | | | | | |
| | | DF | SUM | OF SQUARES | MEAN SQU | ARE | F 69.59 | PROB>F |
| REGRES | SION | 1 | | 0.92472428 | | | 69.59 | 0.0011 |
| ERROR | | 4 5 | | 0.05315185 | 0.01328 | 796 | | |
| TOTAL | | 5 | | 0.97787613 | | | | |
| | | | | STD ERROR | TYPE II | SS | F | PROB>F |
| | | 3.3262832 | | | | | | |
| Z1 | | -0.2563523 | 7 | 0.03072985 | 0.924724 | 428 | 69.59 | 0.0011 |
| | | | | | | | | |
| | | VARIABLE | | | PARTIAL | | | |
| STEP | | RED REMO | VED | IN | R**2 | | | C(P) |
| 1 | Z1 | | | 1 | 0.9456 | υ. | 9456 | 0.15794 |
| | | | | SYS=F-1 | 02 | | | |
| | | DF | CI IL | OF SQUARES | MEAN SQUA | NDF | F | PROB>F |
| REGRES | STON | 3 | SUM | 1.49040707 | 0.496802 | | 99999.99 | 0.0001 |
| ERROR | DION | ő | • | 0.00000000 | 0.000000 | | ,,,,,,,,, | 0.0001 |
| TOTAL | | 3 | | 1.49040707 | 2.00000 | | | |
| | | <u> </u> | _ | | | | | |
| 7 \ | | B VALU | | STD ERROR | TYPE II | SS | F | PROB>F |
| INTERC | FF.I. | 3.0517281 | | | 0 00004 | | 00000 00 | 0 0001 |
| Z1 | | -0.1895159 | | 0 | 0.000046 | | 99999.99 | 0.0001 |
| Z2 | | -0.0013620 | | 0 | 0.000060 | | 99999.99 | 0.0001 |
| Z3 | | 0.0000020 | 5 | 0 | 0.000068 | 324 | 99999.99 | 0.0001 |

| STEP 1 2 3 | ENTE Z1 Z3 Z2 | | IABLE REMO | | IN | PARTIAL R**2 0.9792 0.0208 0.0000 | 0. 1. | ODEL R**2 9792 0000 0000 | C(P) |
|----------------|------------------------|----------|---------------|------|-----------------------|---|--------------|--------------------------------------|-----------------|
| | | | 17 | ARIA | or E | | | | |
| | CIT | ice C | | | REMOVED | T. | | PROB>F | |
| | 31 | | Z1 | , | KELKA ED | F 94.0561 | | 0.0105 | |
| | | | Z1 Z3 | | | 512.6888 | | 0.0281 | |
| | | 3 | Z2 | | | 9999.9999 | | 0.0001 | |
| | | • | | | | | | | |
| | | | | | SYS=F-] | 106 | | | |
| | | | DF | SUM | OF SOLIARES | MEAN SOL | UARE | F | PROB>F |
| REGRES | STON | | 1 | DOLL | OF SQUARES 1.19964727 | 1.1996 | 4727 | 30.66 | 0.0311 |
| ERROR | DION | | 2 | | 0.07824803 | 0.0391 | 2402 | | |
| TOTAL | | | 3 | | 1.27789530 | | | | |
| | | | | | | | | _ | |
| | | | B VALU | | STD ERROR | TYPE I | I SS | F. | PROB>F |
| | EPT | 4. | 7959576 | 4 | 0.09008726 | 1 1006 | A727 | 30.66 | 0.0311 |
| 21 | | -0. | 4988482 | 2 | 0.09008728 | 1.1330 | 4/2/ | 30.00 | 0.0311 |
| | | VAR | IABLE | | NUMBER | PARTIAL | М | ODEL | |
| STEP | ENTE | | REMOV | | IN | R**2 | | R**2 | C(P) |
| 1 | Z1 | | | | 1 | 0.9388 | 0. | 9388 | • |
| ~~~~ | | | | | SYS=F-1 | L5AB | | | |
| | | | | | | | | | |
| | | | DF | SUM | OF SQUARES | MEAN SQ | UARE | F | PROB>F |
| REGRES | SION | | 1 | | 0.15260233 | | | 146.05 | 0.0003 |
| ERROR | | | 4 | | 0.00417943 | 0.0010 | 4486 | | |
| TOTAL | | | 5 | | 0.15678176 | | | | |
| | | | B VALUE | 2 | STD ERROR | TYPE I | T SS | न | PROBSE |
| T NUTEDO | ਾਮ⊂ਜ਼ਾ | 3 | 5276225 | | DID EMILION | | _ 55 | - | 21.02-1 |
| | - | | 1314816 | | 0.01087959 | 0.1526 | 0233 | 146.05 | 0.0003 |
| | | | | | 4000 | 0.000.0 | | | |
| | | | IABLE | | NUMBER | | | | G(D) |
| STEP | | RED | REMOV | /ED | IN | R**2 0.9733 | | R**2 9733 | C(P) 22.1078 |
| 1 | 21 | | | | 1 | 0.9/33 | υ. | 9/33 | 22.10/8 |
| ~~~~ | | | | | SYS=F-1 | L5CD | | | |
| | | | | A | an aa | | | - | DDON' = |
| DEC | GT /2-1 | ļ | DF | SUM | OF SQUARES | | | | |
| REGRES | DION | | 1 6 | | 0.06585355 | | | 1.20 | 0.0338 |
| ERROR TOTAL | | | 7 | | 0.12025370 | 0.00301 | 0003 | | |
| TOTAL | | | , | | 0.12023370 | | | | |
| | | | B VALUE | 2 | STD ERROR | TYPE I | I SS | F | PROB>F |
| INTERC | EPT | 3. | 31595564 | | | | - | _ | - |
| Z2 | - | | 00146562 | | 0.00054382 | 0.0658 | 5355 | 7.26 | 0.0358 |
| | | | | | | | | | |

| STEP | | VARIABLE | | NUMBER | PARTIAL | MC | DEL | |
|--|------------|--|----------------|---|--|--------------------------------|------------|----------------------------|
| | ENTE | RED REMOV | ÆD | IN | R**2 | E | **2 | C(P) |
| 1 | Z 2 | | | 1 | 0.5476 | 0.5 | 5476 | 4.60580 |
| | | | | sys=F-1 | .5E | | | ~ |
| | | T O | SUM (| OF SOUARES | MEAN SQU | INDE | দ | PROR\F |
| REGRES: | STON | 1 | 00.1 | 0.03589868 | 0 03589 | 3868 | 13 64 | 0.0210 |
| ERROR | | 4 | | | 0.00263 | 3260 | 13.01 | 0.0210 |
| TOTAL | | 4 5 | | 0.04642908 | 7,772 | | | |
| T NAMES OF | 2DT | B VALUE 3.06410108 | E . | STO ERROR | TYPE II | ss | F | PROB>F |
| Z3 | SE I | -0.00000446 |) 5 (| 0.00000121 | 0.03589 | 9868 | 13.64 | 0.0210 |
| | | VARIABLE | | NI IMPEP | DAD ጥT AT. | мс | וחביד | |
| STED | ENTER | RED REMOV | | IN | R**2 | 1.10 | //CL | C(P) |
| 1 | 23 | | | 1 | 0.7732 | 0.7 | 732 | 0.15050 |
| | | | | CVC-F_1 | 6AD | | | |
| | | | | 515-r 1 | OAD | | | |
| | | DF | SUM (| OF SQUARES | MEAN SQU | JARE | F | PROB>F |
| REGRESS | SION | 1 | (| | 0.28836 | | | |
| ERROR | | 3 | (| | 0.02710 | | | |
| TOTAL | | 1 3 4 | (| 36967609 | | | | |
| | | | | | | | | |
| | | VARIABLE | | | | | | |
| | | RED REMOV | ED | | R**2 | | | |
| 1 | 21 | | | 1 | 0.7801 | 0.7 | 801 | 0.42225 |
| | | | | SYS=F-1 | 6E | | | |
| | | | | | | | | |
| ,,,,,, | | S MET THE O. | 1500 | SIGNIFICAN | re level eo | פידיאים פו | ∨ ተእጣነገ ጥ | TE MODET |
| | | MET THE O. | 1500 | SIGNIFICAN | CE LEVEL FO | R ENTR | T OTAL Y | Æ MODEL. |
| C.2.3 - | - Elec | | | | CE LEVEL FO | r entr | t otni Y | Æ MODEL. |
| | | ctronics Pro | grams | i | | | | |
| | | | grams | i | | | | |
| | | ctronics Pro | grams | i | | | | |
| | | ctronics Pro | grams | : sys=arc-: | 109 V - | ARE | | |
| | | ctronics Pro | grams | : sys=arc-: of squares | 109V MEAN SQU | ARE 455 | F | PROB>F |
| REGRESS | | otronics Pro | grams SUM C | sys=Arc- of squares 1.16351455 | 109V MEAN SQU 0.16351 | ARE 455 | F | PROB>F |
| RECRESS ERROR | | DF 1 | SUM C | SYS=ARC- OF SQUARES 1.16351455 | 109V MEAN SQU 0.16351 | ARE 455 997 | F | PROB>F |
| RECRESS ERROR | SION | DF 1 3 4 B VALUE -2.99345507 | SUM C | SYS=ARC-: F SQUARES 1.16351455 1.03446990 1.19798445 STD ERROR | 109V MEAN SQU 0.16351 0.01148 | ARE 455 997 | F 14.23 | PROB>F 0.0326 |
| RECRESS ERROR TOTAL | SION | DF 1 3 4 B VALUE | SUM C | ESYS=ARC-: OF SQUARES 0.16351455 0.03446990 0.19798445 | 109V MEAN SQU 0.16351 0.01148 | ARE 455 997 | F 14.23 | PROB>F 0.0326 |
| RECRESS ERROR TOTAL | SION | DF 1 3 4 B VALUE -2.99345507 | SUM C | SYS=ARC-: F SQUARES 1.16351455 1.03446990 1.19798445 STD ERROR | 109V MEAN SQU 0.16351 0.01148 TYPE II | ARE 455 997 SS 455 | F 14.23 | PROB>F 0.0326 PROB>F |
| RECRESS ERROR TOTAL INTERCE Z1 | SION | DF 1 3 4 B VALUE -2.99345507 -0.09510960 | SUM CO | SYS=ARC-: F SQUARES 1.16351455 1.03446990 1.19798445 STD ERROR | 109V MEAN SQU 0.16351 0.01148 TYPE II 0.16351 | ARE .455 .997 | F 14.23 | PROB>F 0.0326 PROB>F |

| | | | | sys=arc | :-54 | | | |
|------------|------------|------------|---------------------------------------|--------------------------|----------------|-------------|---------|--------------|
| | | Ι | OF SUM | OF SQUARES | | ARE | F | PROB>F |
| REGRE | | | | | 0.11782 | 452 | 69.37 | 0.0004 |
| ERROR | | | | 0.00849241 | 0.00169 | 848 | | |
| TOTAL | | | 6 | 0.12631693 | | | | |
| INTER | TEET | | B VALUE 18672110 | STO ERROR | TYPE II | SS | F | PROB>F |
| | | | | 0.01473668 | 0.11782 | 4 52 | 69.37 | 0.0004 |
| | | | | NUMBER | | | | |
| STEP | ENTE | RED | REMOVED | IN | R**2 | R* | *2 | C(P) |
| 1 | Z1 | | | 1 | 0.9328 | 0.93 | 28 | 1.18511 |
| | | | | sys=asn | -63 | ~ | | |
| NO VA | RIABLE | s met | THE 0.150 | 0 SIGNIFICAN | CE LEVEL FO | R ENTRY | INTO TI | HE MODEL. |
| | | | | sys=asn | -70 | | | |
| | | r | E CIM | OF COUNTRY | MENN COLL |) DE | 170 | DDODVE |
| ממיאמם | CTON | Ĺ | r som | OF SQUARES 0.02702549 | MEAN SQU | AKE つった | E CE | 0.0520 |
| REGRES | STON | | 5 | 0.02702549 0.01217836 | 0.01351 | 410 500 | 3.55 | 0.0538 |
| ERROR | | | 5 7 | | 0.00243 | D6 / | | |
| TOTAL | | | 1 | 0.03920385 | | | | |
| ממינית ז | ਾਮਾ⊖ਜ਼ਾ | -3 2 | B VALUE 0442829 | STD ERROR | TYPE II | SS | F | PROB>F |
| Z2 | | -0.0 | 0142023 | 0.00015919 | 0.02070 | RAG | 8 50 | 0.0332 |
| Z 3 | | 0.0 | 0000146 | 0.000000061 | 0.01411 | 101 | 5.79 | 0.0611 |
| | | VARI | ABLE | NUMBER | PARTIAL | MOD | EL | |
| STEP | ENTE | RED | REMOVED | IN | R**2 0.3294 | R* | *2 | C(P) |
| 1 | Z 2 | | | 1 | 0.3294 | 0.32 | 94 | 4.65112 |
| 2 | Z 3 | | | 2 | 0.3599 | 0.68 | 94 | 2.00757 |
| | | | VARIA | BLE | | | | |
| | ST | 9 P | ENTERED | REMOVED | F | | PROB>F | |
| | | 1 | Z 2 | | 2.9475 | | 0.1368 | |
| | | 2 | Z 3 | | 5.7935 | | 0.0611 | |
| | | | | sys=asn- | -99 | | | |
| | | D | F SUM | OF SQUARES | MEAN SQUA | ARE | F | PROB>F |
| RECRES | SION | | 2 | 0.24600823 | 0.123004 | | 8.32 | 0.0256 |
| ERROR | | | 5 | 0.07389455 | 0.014778 | | | - |
| TOTAL | | | 7 | 0.31990278 | | | | |
| INTERC | ept | | B VALUE 4823854 | STD ERROR | TYPE II | SS | F | PROB>F |
| Z1 | | | 0330948 | 0.04664951 | 0.072481 | 174 | 4.90 | 0.0777 |
| Z 3 | | | 0000112 | 0.00000036 | 0.142811 | | 9.66 | 0.0266 |
| | | | · · · · · · · · · · · · · · · · · · · | | | | | |

| STEP 1 2 | ENTER Z3 Z1 | | ABLE REMOVED | NUMBER IN 1 2 | PARTIAL R**2 0.5424 0.2266 | MODEL R**2 0.5424 0.7690 | C(P) 4.71978 2.40197 |
|----------------|-------------------|--------|-----------------|------------------------|-------------------------------------|-----------------------------------|----------------------------|
| | | | VARIA | ALE | | | |
| | ST | 710 | ENTERED | REMOVED | F | PROB>F | |
| | 211 | 1 | Z3 | ALL IO VIII | 7.1129 | 0.0372 | |
| | | 2 | Z1 | | 4.9044 | 0.0777 | |
| | | 4 | <i>u</i> | | | | |
| | | | | SYS=ASN- | 108 | ~_~~~~ | |
| | | | ~ | OF COLUMNIC | MEAN SQUA | RE F | PROB>F |
| | | 1 | | OF SQUARES 0.11931741 | 0 110317 | 41 15.24 | |
| REGRES | SION | | 1 | 0.02348470 | 0.007828 | | 0.0250 |
| ERROR | | | 3 4 | 0.14280211 | 0.007020 | 23 | |
| TOTAL | | | 4 | 0.14200211 | | | |
| | | | B VALUE | STD ERROR | TYPE II | ss f | PROB>F |
| INTERC | EPT | -1.5 | 91448159 | | | | |
| Z1 | | -0.0 | 09411975 | 0.02410798 | 0.119317 | 41 15.24 | 0.0298 |
| | | 173 D | IABLE | NUMBER | PARTIAL | MODEL | |
| CHEC) | E-MITTE | | REMOVED | IN | R**2 | | C(P) |
| STEP 1 | Z1 | RED | KENOVED | 1 | 0.8355 | | 1.14818 |
| Τ. | 21 | | | * | 0.0330 | | |
| | | | | SYS=ASQ- | 133 | | |
| | | | | - OF GOLDEN | MEAN COUR | RE F | PROB>F |
| | | | | OF SQUARES | MEAN SQUA | | 0.0068 |
| REGRES | SION | | 2 | 0.29373628 | 0.146868 | | 0.0000 |
| ERROR | | | 3 | 0.01088670 | 0.003628 | 90 | |
| TOTAL | | | 5 | 0.30462298 | | | |
| | | | B VALUE | STD ERROR | TYPE II | SS F | PROB>F |
| * * ******** | | ^ | 41860430 | 210 EURON | IICH II | - | |
| INTERC | EP.I. | | | 0.00084376 | 0.051463 | 323 14.18 | 0.0328 |
| Z2 | | | 00317744 | 0.00001040 | 0.031403 | | 0.1262 |
| Z 3 | | υ. | 00002187 | 0.00001040 | 0.010055 | 750 1.12 | 0.2202 |
| | | VAR | IABLE | NUMBER | PARTIAL | MODEL | |
| STEP | ENTE | | REMOVED | IN | R**2 | R**2 | C(P) |
| 1 | Z2 | | | 1 | 0.9116 | 0.9116 | 3.29289 |
| 2 | Z3 | | | 2 | 0.0527 | | 2.13874 |
| 2 | 43 | | VARIZ | | •••• | | |
| | C.U. | EP | | REMOVED | F | PROB>F | |
| | 21 | _ | Z2 | ICE IOVED | 41.2264 | 0.0030 | |
| | | 1 2 | | | 4.4243 | 0.1262 | |
| | | 4 | Z 3 | | 7.7477 | 0.1602 | |
| | | | | SYS=ASW | /-32 <i></i> | | |
| | | | | | | , nn | PROB>F |
| | | | | | MEAN SQUA | | |
| REGRES | SSION | | 1 | 0.21856871 | 0.218568 | | 0.0883 |
| ERROR | | | 4 | 0.17379957 | 0.043449 | צמא | |
| TOTAL | | | 5 | 0.39236828 | | | |

| INTERCES | т -1.3 | B VALUE 32228292 | STD ERROR | TYPE II S | SS F | PROB>F |
|----------------|-----------------|---------------------|-----------------|-----------------|---------------------------------------|------------|
| 21 | | | 0.06261459 | 0.218568 | 71 5.03 | 0.0883 |
| | VARI | ABLE | NUMBER | PARTIAL | | |
| STEP E | NTERED | REMOVED | | R**2 | | . , , |
| 1 2 | :1 | | 1 | 0.5570 | 0.5570 | 1.15295 |
| | | | sys=cp- | 1035N | | |
| NO VARIA | BLES MET | THE 0.150 |) significal | NCE LEVEL FOR | ENTRY INTO | THE MODEL. |
| * | | | SYS=JT | IDS | | |
| | | | DID V 1. | | | |
| | | | OF SQUARES | mean squaf | Œ F | PROB>F |
| REGRESSI | ON | 1 | | 0.2414035 | | 0.0001 |
| ERROR | | 3 | 0.00094970 | 0.0003165 | 57 | |
| TOTAL | | 4 | 0.24235329 | | | |
| | | D WATTE | STD ERROR | יייעסקר דד ס | s F | PROB>F |
| I NUTED CET | | 35560158 | SIU ERROR | TIPE II S | , , , , , , , , , , , , , , , , , , , | PROB/F |
| Z1 | | | 0.00742053 | 0.2414035 | 762.57 | 0.0001 |
| ~~ | 0.2 | .0 132 102 | 0.007.12005 | 012121000 | 102101 | 0.0001 |
| | VARI | ABLE | NUMBER | PARTIAL | MODEL | |
| STEP E | NTERED | REMOVED | IN | | | C(P) |
| 1 2 | 1 | | 1 | 0.9961 | 0.9961 | 1.48010 |
| | | | SYS=LAI | NNAV | | |
| | | | | | | |
| | | | OF SQUARES | MEAN SQUAF | E F | PROB>F |
| REGRESSI | ON | 2 | 0.40055971 | | 5 64829.71 | 0.0001 |
| ERROR | | | 0.00001236 | 0.0000030 | 19 | |
| TOTAL | | 6 | 0.40057206 | | | |
| | | מוזגנו מ | STD ERROR | ייייטרבי דד ס | s F | PROB>F |
| מתרות משייות ז | т 0.6 | | SID ERROR | 1165 11 9 | r F | FRODE |
| | | | 0.00106724 | 0.0382015 | 2 12365.66 | 0.0001 |
| | | | 0.00000609 | | 5 12.12 | |
| | mor |) Dr. D | 17 A (D) | D 4 D 67 7 7 7 | MODE | |
| STEP E | vari. NTERED | ABLE REMOVED | NUMBER | PARTIAL R**2 | MODEL R**2 | C(P) |
| | 1 | KENIOVED | IN 1 | 0.9999 | 0.9999 | 9.21020 |
| | 2 | | 2 | 0.9999 | 1.0000 | 2.02917 |
| <i>- 4</i> | ٠. | | 2 | 0.0001 | 1.0000 | 2.02311 |
| | | VARIA | BLE . | | | |
| | STEP | ENTERED | REMOVED | F | PROB>F | |
| | | Z1 | | 9999.9999 | 0.0001 | |
| | 2 | Z 2 | | 12.1235 | 0.0253 | |

| | | sys=lan | TARP | | |
|------------------------------|---------------------------------------|--|---|----------------------------|---------------------------|
| RECRESSION ERROR TOTAL | 2 | OF SQUARES 0.32593843 0.00005743 0.32599587 | MEAN SQUARE 0.16296922 0.00001436 | F 11350.17 | PROB>F 0.0001 |
| T NTERCEPT | B VALUE 0.43759694 | STD ERROR | TYPE II SS | F | PROB>F |
| | | 0.00235097 0.00001344 | | 1940.79 10.29 | |
| STEP ENTE 1 Z1 2 Z2 | VARIABLE RED REMOVED | NUMBER IN 1 2 | | | C(P) 15.4321 4.1605 |
| | VARIA | BLE | | | |
| ST | EP ENTERED 1 Z1 2 Z2 | REMOVED | F 7940.7559 10.2871 | PROB>F 0.0001 0.0327 | |
| | | sys=lant | REC | | |
| RECRESSION ERROR TOTAL | DF SUM 1 3 4 | OF SQUARES 0.14785176 0.00058456 0.14843632 | MEAN SQUARE 0.14785176 0.00019485 | 758.78 | PROB>F 0.0001 |
| INTERCEPT | B VALUE -0.34649331 -0.14556527 | STD ERROR 0.00528443 | TYPE II SS | F 758.78 | |
| | VARIABLE RED REMOVED | | PARTIAL | MODEL R**2 | C(P) |
| C.2.4 - Hel | icopter Programs | <u> </u> | | | |
| | | SYS=H | н-52 | | |
| | DF SUM | OF SQUARES | MEAN SQUARE | F | PROB>F |
| RECRESSION ERROR TOTAL | 1 4 5 | 0.12412828 0.01275667 0.13688495 | 0.12412828 0.00318917 | 38.92 | 0.0034 |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| | 0.83324089 -0.18605919 | 0.02982321 | 0.12412828 | 38.92 | 0.0034 |

| 1 | Z1 | RED REI | MOVED | IN 1 | PARTIAL R**2 0.9068 | R**2 0.9068 | | |
|---------------------------|-------------------------|---|----------------|--|---|---|---------------------|--------------------------------------|
| | | | ~ | sys=ch- | -46 | | | |
| RECRES ERROR TOTAL | SION | DF 1 6 7 | | OF SQUARES 1.12150675 0.18252104 1.30402778 | MEAN SQU 1.12150 0.03042 | ARE 675 36. 017 | F .87 | PROB>F 0.0009 |
| TATTERC | ጥርም | B VAI 2.22820 | LUE 194 | STD ERROR | TYPE II | SS | F | PROB>F |
| Z1 | | -0.23817 | 390 | 0.03922683 | 1.12150 | 675 36. | .87 | 0.0009 |
| STEP 1 | ENTE Z1 | VARIABLE RED REI | 10VED | NUMBER IN 1 | PARTIAL R**2 0.8600 | MODEL R**2 0.8600 | | C(P) 1.90826 |
| | | | | SYS=H- | -53 | | | |
| REGRES | SION | DF 1 | SUM | OF SQUARES 0.36413891 | MEAN SQU 0.36413 0.00646 | ARE 891 56. | F | PROB>F |
| INTERC | EPT | 2.072660 | 30 | | TYPE II 0.36413 | | | |
| | ente | VARIABLE | | NUMBER IN | PARTIAL R**2 0.9038 | MODEL R**2 | | C(P) |
| | | | | SYS=CH- | 47 | | | |
| REGRESS ERROR TOTAL | | DF | SUM | OF SQUARES | MEAN SQU 0.31532 0.01310 | ARE 837 24. | F | PROB>F |
| INTERCI Z1 Z2 Z3 | ept | B VAL 1.981506 -0.075907 -0.001762 0.000006 | 21 20 84 | STD ERROR 0.02686504 0.00051800 0.00000302 | TYPE II 0.10465 0.15182 0.06788 | 273 7. 170 11. | F 98 58 18 | PROB>F 0.0223 0.0093 0.0524 |
| STEP 1 2 3 | ENTER Z2 Z1 Z3 | VARIABLE RED REM | OVED | NUMBER IN 1 2 3 | PARTIAL R**2 0.6285 0.2071 0.0646 | MODEL R**2 0.6285 0.8356 0.9002 | | C(P) 21.7774 7.1790 4.0000 |

VARIABLE

| | | | | HKIH | | | | | | |
|-----------|------------|--------|---------|-------|------------|------------|-------------------|----------------|--------|-----------------|
| | ST | EIP . | ENTERE | D | REMOVED | | F | | PROB> | F |
| | | | 22 | | | | F 16.9213 | | 0.002 | |
| | | | 21 | | | | 11.3352 | | 0.002 | |
| | | | | | | | | | | |
| | | 3 | 23 | | | | 5.1790 | | 0.052 | 4 |
| | | | | | SYS= | =H−5 | 4 | | | |
| | | | | | | | | | | |
| | | D | F | SUM | OF SOUARE | CS. | MEAN SO | N JARF | : | F PROBSE |
| REGRESS | TON. | _ | 1 | | 0.1800033 | 33 | 0 1900 | 1.1333 | 10.4 | F PROB>F 0.0481 |
| | 71014 | | 2 | | 0.0516752 |) O | 0.1000 | ,0555 | 10.4 | 2 0.0401 |
| ERROR | | | 3 | | | | 0.01/2 | 22509 | | |
| TOTAL | | | 4 | | 0.2316786 | 1 | | | | |
| | | | | _ | | _ | | | | |
| | | | | | STD ERRO |)R | TYPE I | II SS |] | F PROB>F |
| INTERCE | | | | | | | | | | |
| Z1 | | -0.1 | 5447484 | 4 | 0.0477857 | 74 | 0.1800 | 00333 | 10.4 | 5 0.0481 |
| | | | | | | _ | | | | |
| | | VARI | ABLE | | NUMBER | | PARTIAL | | MODEL | |
| STED | | | | | | | | | | C(P) |
| | Z1 | | | صد، | | | | | | |
| 1 | 2 L | | | | T | | 0.7770 | | 0.7770 | 1.50618 |
| | | | | | | | | | | |
| | | | ~ | | SYS=H | IH-6 | UD | | | |
| | | _ | | CI D. | OF 601125 | | \ <i>m</i> >11 00 | | | |
| | | U | F. | SUM | OF SQUARE | S | MEAN SU | UARE | 1 | F PROB>F |
| REGRESS | ION | | 1 | | 0.0691215 | 3 | 0.0691 | L2153 | 52.99 | 9 0.0184 |
| ERROR | | | 2 | | 0.0026088 | 2 | 0.0013 | 30441 | | |
| TOTAL | | | 3 | | 0.0717303 | | | | | |
| | | | | | | | | | | |
| | | | B VALUE | E | STD ERRO | R | TYPE I | I SS | F | F PROB>F |
| INTERCE | PTP | 2 2 | 3770674 | i | | •• | | | - | |
| Z1 | | -0.0 | 0600000 | • | 0.0119388 | 0 | 0 0601 | 21.52 | E2 00 | 0 0104 |
| 41 | | -0.0 | 003000 | , | 0.0113300 | 9 | 0.0631 | .ZI33 | 52.93 | 9 0.0184 |
| | | UADT | AD: E | | NUMBER | | DADMIAI | | MODET | |
| CITIZED. | | | | | | | PARTIAL | | MODEL | ~ (=) |
| STEP | ENTER | ŒD | REMOV | ED | IN | | R**2 | | R**2 | C(P) |
| 1 | Z 1 | | | | 1 | | 0.9636 | | 0.0636 | |
| 1 | 41 | | | | 1 | | 0.9636 | | 0.9636 | • |
| | | | | | | cn | 2 | | | |
| | | | | | D10 | J11 . | , | | | |
| | | D | F | SUM | OF SQUARE: | ' S | MEAN SQ | | F | PROB>F |
| DECEDERCE | TON | | | 5011 | | | | | _ | |
| REGRESS | ION | | 1 | | 0.3214316 | | 0.3214 | | 24.60 | 0.0016 |
| ERROR | | | 7 | | 0.0914754 | | 0.0130 | 6792 | | |
| TOTAL | | ; | 8 | | 0.41290709 | 9 | | | | |
| | | | | | | | | | | |
| | | 1 | B VALUE | ; | STD TRROP | R | TYPE I | I SS | F | PROB>F |
| INTERCE | PT | 1.49 | 9416647 | ' | | | | | | |
| Z1 | _ | | 5806200 | | 0.03187033 | 1 | 0.3214 | 3167 | 24.60 | 0.0016 |
| | | U . I. | -5552 | • | 0.0510705. | - | 0.3214 | J 1 0 1 | 24.00 | , 0.0010 |
| | | VARIA | ARLE | | NUMBER | | PARTIAL | | MODEL | |
| STEP | ENTER | | | יוים | | | R**2 | | R**2 | 0/D) |
| | | œU | REMOV | EU. | IN | | | | | C(P) |
| 1 | Z1 | | | | 1 | | 0.7785 | (| 0.7785 | 6.18436 |
| | | | | | | | | | | |

C.2.5 - Tactical Armament Programs

| | | | | SYS=LLI | LGB | | |
|---|------------|---------|-------------------------|--------------------------|-----------------------|------------|------------------|
| REGRE | SSTON | DF 1 | | OF SQUARES 0.71772163 | MEAN SQUA 0.717721 | | PROB>F 0.0001 |
| ERROR | | 8 | | 0.00152979 | 0.000191 | | 0.0001 |
| TOTAL | | ġ | | 0.71925142 | 0.000131 | 4.4 | |
| 1011111 | | • | • | 0.71723112 | | | |
| INTER | CEPT | | VALUE .061063 | STD ERROR | TYPE II S | S F | PROB>F |
| Z1 | | -0.17 | 034813 | 0.00278055 | 0.717721 | 63 3753.30 | 0.0001 |
| | | VARIA | BLE | NUMBER | PARTIAL | MODEL | |
| STEP | ENTE | RED | REMOVED | IN | R**2 | R**2 | C(P) |
| 1 | 21 | | | 1 | 0.9979 | 0.9979 | 5.09779 |
| | | | | | | | |
| | | | | SYS=CE | M | | |
| | | DF | | OF SQUARES | MEAN SQUA | RE F | PROB>F |
| REGRES | SSION | 3 | | 2.39311941 | 0.797706 | 47 994.08 | 0.0001 |
| ERROR | | 4 | | 0.00320984 | 0.000802 | 46 | |
| TOTAL | | 7 | • | 2.39632925 | | | |
| | | В | VALUE | STD ERROR | TYPE II | SS F | PROB>F |
| INTERC | TEPT | -1.41 | 663745 | | | | |
| Z1 | • | | 206595 | 0.01131836 | 0.610026 | 77 760.20 | 0.0001 |
| Z 2 | | | 000296 | 0.00000037 | 0.049909 | | 0.0014 |
| Z3 | | | 000000 | 0.00000000 | 0.029686 | | 0.0014 |
| 20 | | 0.00 | 000000 | 0.0000000 | 0.025000 | 77 30.33 | 0.0037 |
| | | VARIA | BLE | NUMBER | PARTIAL | MODEL | |
| STEP | ENTE | RED | REMOVED | IN | R**2 | R**2 | C(P) |
| 1 | Z1 | | | 1 | 0.9671 | 0.9671 | 94.1097 |
| 2 | Z2 | | | 2 | 0.0191 | 0.9863 | 38.9947 |
| 3 | Z 3 | | | 3 | 0.0124 | 0.9987 | 4.0000 |
| | | | | | | | |
| | Orm | ~ - | VARIAE | | _ | | |
| | ST | | | REMOVED | F | PROB>F | |
| | | 1 Z | | | 176.6261 | 0.0001 | |
| | | 2 Z | | | 6.9661 | 0.0460 | |
| | | 3 Z | 3 | | 36.9947 | 0.0037 | |
| | | | | SYS=G | BU-15 | | |
| | | DF | SUM | OF SQUARES | MEAN SQUAF | E F | PROB>F |
| REGRES | SION | 2 | | 0.15959725 | | | |
| ERROR | ~. ~., | 6 | | 0.01732231 | 0.0028870 | | 0.0003 |
| TOTAL | | 8 | | 0.17691956 | 0.0020070 | ,,, | |
| • ~ • • • • • • • • • • • • • • • • • • | | 3 | | 0.11031330 | | | |

| 7.3.00 0.00 .00 | T-Y-101 | 1 (| B VALUE | | STO ERROR | TY | PE II S | s r | PROB>F |
|----------------------------|------------------------|--|---------------------------|--------------------------|--|-------------------------------------|--------------------------|---|--|
| INTERC Z2 Z3 | 15.T. | -1.54399316 -0.00037584 0.00000051 | | 0.00005466 0.00000008 | | 0.13651261 0.11268652 | | 0.0005 0.0008 | |
| STEP 1 2 3 4 | ENTE Z1 Z3 Z2 | | IABLE REMOV Z1 | ÆD | NUMBER IN 1 2 3 | PART: R: 0.5: 0.20 0.1: | **2 313 023 725 | MODEL R**2 0.5313 0.7336 0.9060 0.9021 | C(P) 19.9435 11.1799 4.0000 2.2107 |
| 3 | | | 21 | | L | 0.00 | 740 | 0.7021 | 2,210, |
| | | | | RIA | | | _ | DDOD) | |
| | ST | EP 1 2 3 4 | ENTEREI Z1 Z3 Z2 |) | REMOVED Z1 | 7.93 4.59 9.1 0.23 | 544 799 | PROB>F 0.0259 0.0768 0.0291 0.6655 |) } |
| C.2.6 | - Tac | tica. | l Missil | le P | | 3.31/ | | | |
| | | | | | SYS=AMR | AAM | | | |
| | | 1 | OF . | SUM | OF SQUARES | MEAL | n squar | E F | PROB>F |
| REGRES ERROR TOTAL | SION | | 1 8 9 | | 3.86655114 0.00422694 3.87077808 | | 3665511 0005283 | | 0.0001 |
| INTERC | ም ር | B VALUE 1.68243228 -0.35610306 | | STO ERROR | TY | TYPE II SS F | | PROB>F | |
| Z1 | EAT 1 | | | | 0.00416276 | 3.8 | 3.86655114 7317.93 | | 0.0001 |
| | | VAR | ABLE | | NUMBER | PART | [AL | MODEL | |
| STEP | ENTE | RED | REMOV | ÆD | IN | | **2 | R**2 | C(P) |
| 1 | 21 | | | | 1 | 0.99 | 989 | 0.9989 | 1.62694 |
| | | | | | SYS=H | ARM | | | |
| REGRES ERROR TOTAL | SION | | OF 1 9 | SUM | OF SQUARES 2.39604033 0.03689201 2.43293234 | 2.3 | 3960403 | 3 584.53 | PROB>F 0.0001 |
| T NITTED C | ፍቸንጥ | B VALUE 0.55630848 | | | STD ERROR | TY | PE II S | s F | PROB>F |
| Z1 | EPT. | | 23942286 | | 0.00990292 | 2.3 | 3960403 | 3 584.53 | 0.0001 |
| STEP | ENTE | | IABLE REMOV | ÆD | NUMBER IN | | | MODEL R**2 | C(P) |
| 1 | Z1 | | | | 1 | | | 0.9848 | |

| | | SYS=II | R | | |
|------------|------------------------|--------------------------|---|-------------|---------|
| REGRESSION | DF SUM | OF SQUARES 2.55907835 | MEAN SQUARE 2.55907835 0.02031478 | F 125.97 | |
| ERROR | 7 | 0.14220346 | 0.02031478 | 22017. | 0.0002 |
| TOTAL | 8 | 2.70128181 | 0,02031470 | | |
| 1011111 | · · | 2.70120101 | | | |
| INTERCEPT | B VALUE -0.31423346 | STD ERROR | TYPE II SS | F | PROB>F |
| Z1 | -0.24873883 | 0.02216194 | 2.55907835 | 125.97 | 0.0001 |
| | | | PARTIAL N | | |
| | RED REMOVED | IN | R**2 | R**2 | C(P) |
| 1 Z1 | | 1 | 0.9474 0. | .9474 | 0.61507 |
| | | CVC_ATM7 | F-R | | |
| | | DID-AIM | F -K | | |
| | DF SUM | OF SOLIARES | MEAN SQUARE | ন | PROBSE |
| REGRESSION | | 3 44080698 | 3.44080698 | 605 41 | 0 0001 |
| | | | 0.00568347 | 003.41 | 0.0001 |
| TOTAL | | 3.47490783 | 0.00500347 | | |
| IUIAL | , | 3.4/450/63 | | | |
| INTERCEPT | B VALUE 1.07890599 | STD ERROR | TYPE II SS | F | PROB>F |
| Z1 | -0.39736762 | 0.01614988 | 3.44080698 | 605.41 | 0.0001 |
| | | | | | |
| | VARIABLE | NUMBER | PARTIAL M | ODEL | |
| STEP ENTE | RED REMOVED | IN | R**2 | | C(P) |
| 1 Z1 | | 1 | 0.9902 0. | | |
| | | | | | |
| | ~~ | SYS=AIM7E | F-GD | | |
| | DF SUM | OF SQUARES | MEAN SQUARE | ন | PRORSE |
| REGRESSION | | 4.95424289 | 4.95424289 | 237.69 | 0.0001 |
| ERROR | 4 | 0.08337301 | 0.02084325 | 237.03 | 0.0001 |
| TOTAL | | 5.03761591 | C2CF004323 | | |
| 1011111 | 3 | 3.03/01391 | | | |
| INTERCEPT | B VALUE 1.04508899 | STD ERROR | TYPE II SS | F | PROB>F |
| Z1 | -0.46191702 | 0.02996112 | 4.95424289 | 237.69 | 0.0001 |
| | | | - | | |
| | VARIABLE | NUMBER | | ODEL | |
| STEP ENTE | RED REMOVED | IN | R**2 | R**2 | C(P) |
| 1 Z1 | | 1 | 0.9834 0. | 9834 | 0.65336 |

C.3 - Modified Alternative One Stepwise Regression

This section contains the summary results produced by the stepwise regression procedure in SAS. The SAS program used to produce this run was discussed in Appendix B.3.

C.3.1 - Bomber Aircraft Programs

| | | SYS=B- | 1B | | |
|--------------|-------------|---------------|------------|-----------|--------|
| | DF S | UM OF SQUARES | mean squar | E F | PROB>F |
| REGRESSION | 2 | 1.47983409 | 0.7399170 | 5 2237.75 | 0.0004 |
| ERROR | | 0.00066131 | 0.0003306 | 5 | |
| TOTAL | 4 | 1.48049540 | | | |
| | B VALUE | STD ERROR | TYPE II S | s F | PROB>F |
| | 6.12415495 | | | | |
| | | 0.03635445 | | 9 39.10 | |
| Z2 | -0.10701422 | 0.04649846 | 0.0017513 | 7 5.30 | 0.1480 |
| | VARIABLE | NUMBER | PARTIAL | | |
| STEP ENTE | RED REMOVE | D IN | R**2 | R**2 | C(P) |
| 1 21 | | 1 | 0.9984 | | • |
| 2 22 | | 2 | 0.0012 | 0.9996 | |
| | VAR | IABLE | | | |
| ST | EP ENTERED | REMOVED | F | PROB>F | |
| | 1 Z1 | | 1837.8954 | 0.0001 | |
| | 2 72 | | 5.2967 | | |
| | | SYS=B- | 52 | | |
| | | | | | |
| | DF S | UM OF SQUARES | MEAN SQUAR | e f | PROB>F |
| REGRESSION | 1 | 0.98951441 | 0.9895144 | 1 10.54 | 0.0118 |
| ERROR | 8 | 0.75101711 | 0.0938771 | 4 | |
| TOTAL | 9 | 1.74053152 | | | |
| | | STD ERROR | TYPE II S | s F | PROB>F |
| INTERCEPT | 4.66879195 | | | | |
| Z1 | -0.21690646 | 0.06680998 | 0.9895144 | 1 10.54 | 0.0118 |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| | RED REMOVE | D IN | ロサオフ | R**2 | C(P) |
| 1 Z 1 | | 1 | 0.5685 | 0.5685 | |
| | | SYS=B-5 | 58 | | |

NO VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

C.3.2 - Fighter Aircraft Programs

| | | SYS=A-1 | 0 | | |
|------------------------------|---------------------------|--|---|------------------------|------------------|
| RECRESSION ERROR TOTAL | 1 | OF SQUARES 0.20697599 0.16217060 0.36914658 | MEAN SQUARE 0.20697599 0.02316723 | 8.93 | PROB>F 0.0203 |
| | B VALUE 2.98062538 | STD ERROR | TYPE II SS | | |
| Z 2 | -0.18585056 | 0.06217860 | 0.20697599 | 8.93 | 0.0203 |
| STEP ENTE | VARIABLE RED REMOVED | IN | PARTIAL R**2 0.5607 0 | R**2 | C(P) -0.02786 |
| | | SYS=F-1 | 00 | | |
| RECRESSION ERROR TOTAL | 1 3 | OF SQUARES 0.51333658 0.01618481 0.52952138 | MEAN SQUARE 0.51333658 0.00539494 | F 95.15 | PROB>F 0.0023 |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| | 2.18648143 -0.15830979 | 0.01622930 | 0.51333658 | 95.15 | 0.0023 |
| STEP ENTE 1 Z1 | RED REMOVED | IN 1 | 0.9694 0 | R**2 .9694 | C(P) |
| | | SYS=F-1 | 01 | | |
| RECRESSION ERROR TOTAL | 4 | 0.92472428 | MEAN SQUARE 0.92472428 0.01328796 | F 69.59 | PROB>F 0.0011 |
| INTERCEPT | B VALUE 3.32628329 | STD ERROR | TYPE II SS | F | PROB>F |
| Z1 | -0.25635237 | 0.03072985 | 0.92472428 | 69.59 | 0.0011 |
| STEP ENTE | VARIABLE RED REMOVED | NUMBER IN 1 | R**2 | MODEL R**2 .9456 | C(P) -0.64188 |

| | | | | | • | | | |
|------------|------------|------------|------------------------|-----------------------|--------------------|---------------------|--------|------------|
| | | | | SYS≈F- | L02 | | | |
| | | DF | CIM | OF COUNTRY | MEAN COLU | מחנ | 12 | מישטחט מיש |
| REGRESSION | | 3 | | OF SQUARES 1.49040707 | 0.496802 | ARE 236 99999. | | |
| ERROR | SION | 0 | | 0.00000000 | 0.000000 | | | 0.0001 |
| TOTAL | | 3 | | 1.49040707 | 0.000000 | , o o | | |
| 1011111 | | _ | | 2.15010707 | | | | |
| INTERC | EPT | 3.93 | VALUE 259582 | STD ERROR | TYPE II | SS | F | PROB>F |
| Z1 | | | 479395 | 0 | 0.040636 | 507 99999. | 99 | 0.0001 |
| Z2 | | -0.17 | 351653 | 0 | 0.001090 | | 99 | 0.0001 |
| Z 4 | | 0.00 | 452538 | 0 | 0.003617 | 762 99999. | 99 | 0.0001 |
| | | WARTA | BLE | NUMBER | PARTIAL | MODEL | | |
| STEP | ENTE | | REMOVED | IN | R**2 | R**2 | | C(P) |
| 1 | 71 | | (MKO VID | 1 | 0.9792 | | | C(L) |
| 2 | Z4 | | | 2 | 0.0201 | | | • |
| 3 | Z2 | | | 3 | 0.0007 | | | • |
| _ | | | | | | | | |
| | cen | icio ta | VARIA | | ъ | DDOT | 1 1 12 | |
| | 51 | | | REMOVED | F 04.0561 | PROE | | |
| | | 1 Z | | | 94.0561 27.4485 | 0.01 0.12 | | |
| | | 2 Z | | | 9999.9999 | 0.12 | | |
| | | 3 % | 2 | | בבבבי בבבב | 0.00 |)UI | |
| | | | | sys=F-1 | L06 | | | |
| | | DF | SUM | OF SQUARES | MEAN SQUA | RE | F | PROB>F |
| REGRES | SION | 1 | | 1.19964727 | 1.199647 | 27 30. | 66 | 0.0311 |
| ERROR | | 2 | | 0.07824803 | 0.039124 | 102 | | - ·- |
| TOTAL | | 3 | | 1.27789530 | | | | |
| | | В | VALUE | STD ERROR | TYPE II | SS | F | PROB>F |
| INTERC | ept | 4.79 | | | | | | |
| Z1 | | | | 0.09008726 | | ¹ 27 30. | 66 | 0.0311 |
| | | VARIA | | | | MODEL | | |
| STEP | ENTE | RED | REMOVED | IN | R**2 | | | C(P) |
| 1 | Z1 | | | 1 | 0.9388 | 0.9388 | | • |
| | | | | sys=F-1 | .5A/B | | | |
| | | | | | | | | |
| | ~~~ | DF | | OF SQUARES | | | F | |
| REGRES | SION | 1 | | 0.15260233 | | | บร | 0.0003 |
| ERROR | | 4 | | 0.00417943 | 0.001044 | 186 | | |
| TOTAL | | 5 | | 0.15678176 | | | | |
| | | В | VALUE | STD ERROR | TYPE II | SS | F | PROB>F |
| INTERCEPT | | 3.52762254 | | | | - - | _ | |
| Z1 | | | | 0.01087959 | 0.152602 | 33 146. | 05 | 0.0003 |
| | | ******* | חז ה | ATT PLATFORM | n k n m z > v | MODER | | |
| Carriero | Cay Attack | VARIAI | | NUMBER | PARTIAL R**2 | MODEL R**2 | | C(D) |
| STEP | ENTE | スたい | REMOVED | IN 1 | 0.9733 | 0.9733 | | C(P) |
| 1 | Zl | | | 1 | 0.7/33 | 0.3/33 | | -0.25298 |

| | | ~ | | sys=F-15 | 5CD | | | |
|------------|------------|----------------|----------------|-----------------------|--------------------------------|-----------|------------|------------------|
| REGRES | STON | DF 2 | SUM | OF SQUARES 0.10028222 | MEAN SQUA 0.050141 | .11 | F 12.55 | PROB>F 0.0112 |
| ERROR | | 5 | | 0.01997148 | 0.003994 | 130 | | |
| TOTAL | | 7 | | 0.12025370 | | | | |
| | | 1 2 1 | VALUE | STD ERROR | TYPE II | SS | F | PROB>F |
| INTERC | es Court | 4.406 | | DID Efficie | | | | |
| 72 72 | | -0.383 | | 0.07694411 | 0.099376 | 555 | 24.88 | 0.0041 |
| Z3 | | 0.048 | | 0.01516091 | 0.040088 | 325 | 10.04 | 0.0249 |
| 27 | | 3,513 | | | | | | |
| | | VARIAB | LE | NUMBER | PARTIAL | MOD | | G(D) |
| STEP | ENTER | ED 1 | REMOVED | IN | R**2 | R* | | C(P) 8.43111 |
| 1 | Z 2 | | | 1 | 0.5006 | 0.50 | | 2,13368 |
| 2 | Z 3 | | | 2 | 0.3334 | 0.83 | 139 | 2,13360 |
| | | | **** | nt to | | | | |
| | Office | TO 12% 0 | VARIA TERED | REMOVED | F | | PROB>F | |
| | STE | | | (EMOVED | 6.0134 | | 0.0496 | |
| | | 1 Z2 2 Z3 | | | 10.0364 | | 0.0249 | |
| | | 2 23 | | | | | | |
| | | | | sys=F-1 | 5E | | | |
| | | | | | | | | カカのカンゼ |
| | | DF | SUM | OF SQUARES | MEAN SQU | | F | PROB>F 0.0182 |
| REGRES | SION | 1 | | 0.03658110 | 0.03658110 14.86 0.00246199 | | | 0.0102 |
| ERROR | | 4 | | 0.00984798 | | | | |
| TOTAL | | 5 | | 0.04642908 | | | | |
| | | _ | | amo PRRAP | TYPE II | 95 | F | PROB>F |
| | | | VALUE | STD ERROR | IIEE II | 55 | • | |
| INTER | EF.I. | -0.419 | 308354 | 0.10880016 | 0.03658 | 110 | 14.86 | 0.0182 |
| Z 2 | | ~0.413 | 20020 | 0.10000010 | | | | |
| | | VARIA | BLE | NUMBER | | MO | | > |
| STEP | ENTE | | REMOVED | IN | R**2 | R | | C(P) |
| 1 | 72 | | | 1 | 0.7879 | 0.7 | 879 | 1.36436 |
| | | | | -1 m 1 | ICAD . | | | |
| | | | | SYS=F-1 | LOAB | · | | |
| | | DF | Q1 TA | OF SQUARES | MEAN SQU | IARE | F | PROB>F |
| 2222 | aatoM | 1 | 301 | 0.30339378 | - | | 13.73 | 0.0341 |
| REGRE | | 3 | | 0.06628231 | | | | |
| ERROR | | 4 | | 0.36967609 | 0.000 | | | |
| TOTAL | | 7 | | 0,0000,000 | | | | |
| | | В | VALUE | STO ERROR | TYPE II | SS | F | PROB>F |
| INTERCEPT | | | 323054 | | | | | 0.0044 |
| z 3 | | 0.119 | 921293 | 0.03217053 | 0.30339 | 378 | 13.73 | 0.0341 |
| | | | | AR DOTT | ጠ አ ውሞ፣ አ፣ | MO | DEL | |
| | _ | VARIA | | NUMBER | | | **2 | C(b) |
| STEP | | NTERED REMOVED | | IN 1 | 0.8207 | | 207 | J(2 / |
| 1 | Z 3 | | | 1 | 0.0207 | 0.0 | 241 | • |

-----SYS=F-16E-----

NO VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

C.3.3 - Electronics Programs

| | | | 4.000 | | |
|------------|-----------------|------------|------------------|--------|---------|
| | | SYS=ARC | -109 V | | |
| | DF SUM | OF SQUARES | MEAN SQUARE | F | PROB>F |
| REGRESSION | | 0.16857539 | 0.16857539 | 17.20 | 0.0255 |
| ERROR | 3 | 0.02940906 | 0.00980302 | | |
| TOTAL | 3 4 | 0.19798445 | | | |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| INTERCEPT | -2.85965214 | | | | |
| 22 | -0.13022074 | 0.03140241 | 0.16857539 | 17.20 | 0.0255 |
| | VARIABLE | NUMBER | PARTIAL | MODEL. | |
| STEP ENTE | RED REMOVED | IN | R**2 | | C(P) |
| 1 22 | | 1 | 0.8515 | 0.8515 | • |
| | | SYS=ARC | -54 | | |
| | | | _ | | |
| | | | MEAN SQUARE | | |
| REGRESSION | | | 0.11782452 | | 0.0004 |
| ERROR | 5 6 | 0.00849241 | 0.00169848 | | |
| TOTAL | 6 | 0.12631693 | | | |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| | -3.18672110 | | | | |
| Z1 | -0.12274020 | 0.01473668 | 0.11782452 | 69.37 | 0.0004 |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP ENTE | RED REMOVED | IN | R**2 | R**2 | C(P) |
| 1 21 | | 1 | R**2 0.9328 (| 0.9328 | 2.39221 |
| | | SYS=ASN | -63 | | |
| | | | | | |
| | S MET THE 0.150 | | | | |
| | | SYS=ASN | -70 | | |
| | DE SUM | OF SQUARES | MEAN SQUARE | F | PROB>F |
| REGRESSION | 1 | 0.02259868 | 0.02259868 | 8.17 | 0.0289 |
| ERROR | 6 | 0.01660517 | 0.00276753 | | |
| TOTAL | 7 | 0.03920385 | | | |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| INTERCEPT | -3.14533001 | | | | |
| Z2 | -0.04210252 | 0.01473373 | 0.02259868 | 8.17 | 0.0289 |

| STEP 1 | ENTE Z2 | VARIABLE RED REM | OVED | NUMBER IN 1 | PARTIAL R**2 0.5764 | 0.5 | 764 | C(P) 1.63655 |
|---------------------------|------------------|------------------------------------|-----------|--|-------------------------------------|-----------------------|----------------------------|----------------------------|
| | | | | SYS=AS | N-99 | | | |
| REGRES ERROR TOTAL | SION | DF 2 5 7 | | OF SQUARES 0.21690825 0.10299453 0.31990278 | 0.1084 | 5413 | F 5.27 | PROB>F 0.0588 |
| | | B VAI | UE. | STD ERROR | TYPE I | I SS | F | PROB>F |
| INTERC Z2 Z3 | | -1.982816 -0.223215 0.028257 | 50 542 | 0.07241846 0.01503053 | 0.1957 | 0144 | 9.50 3.53 | |
| STEP 1 2 | ENTE Z2 Z3 | VARIABLE RED REM | | NUMBER IN 1 2 | PARTIAL R**2 0.4505 G.2276 | MO R 0.4 0.6 | | C(P) 56.9445 33.7055 |
| | | | VARIAB | LE | | | | |
| | ST | EP ENTER 1 Z2 2 Z3 | ED | REMOVED | F 4.9183 3.5343 | | PROB>F 0.0684 0.1189 | |
| | | | | sys=asi | N-108 | | | |
| REGRES ERROR TOTAL | SION | DF 1 3 4 | | OF SQUARES 0.11931741 0.02348470 0.14280211 | | L741 | F 15.24 | |
| | | | UE 1 | STD ERROR | TYPE I | ss | F | PROB>F |
| INTERC Z1 | ept | -1.914481 -0.094119 | | 0.02410798 | 0.1193 | 1741 | 15.24 | 0.0298 |
| STEP 1 | ENTE Z1 | | OVED | NUMBER IN 1 | R**2 0.8355 | 0.8 | **2 355 | C(P) |
| | | | | SYS=ASQ- | -133 | | | |
| REGRES. ERROR TOTAL | SION | DF 1 4 5 | | OF SQUARES 0.27102133 0.03360165 0.30462298 | 0.27102 | 2133 | 32.26 | PROB>F 0.0047 |
| 71 m | | B VAL | | STD ERROR | TYPE II | SS | F | PROB>F |
| INTERCI | F7-1, | -0.214508 -0.150533 | | 0.02650217 | 0.27102 | 2133 | 32.26 | 0.0047 |

| STEP 1 | Z1 | red r | EMOVED | IN 1 | R**2 0.8897 | | | |
|--------------------------|------------------|--------------------|--------------|--|-------------------------------------|-----------------------------------|----------|------------------|
| | | | | sys=asw-3 | 32 | | | |
| RECRES ERROR TOTAL | SION | DF 1 4 5 | SUM | OF SQUARES 0.21856871 0.17379957 0.39236828 | MEAN SQU 0.21856 0.04344 | ARE 871 5. 989 | F .03 | PROB>F 0.0883 |
| INTERC | EPT | В V -1.3222 | ALUE 8292 | STD ERROR | TYPE II | SS | F | PROB>F |
| Z1 | | -0.1404 | 3494 | 0.06261459 | 0.21856 | 871 5. | .03 | 0.0883 |
| STEP 1 | | | | IN | PARTIAL R**2 0.5570 | R**2 | | C(P) 28.0511 |
| | | | | SVS=(*D- | ·1035N | | | |
| | | | | 515-Q | 10331 | | | |
| REGRES ERROR TOTAL | SION | | | | MEAN SQU 0.06223 0.00839 | | F 41 | PROB>F 0.0528 |
| INTERC | EPT | B V -2.0146 | | STD ERROR | TYPE II | SS | F | PROB>F |
| Z4 | | -0.0648 | 8000 | 0.02380008 | 0.06223 | 814 7. | 41 | 0.0528 |
| STEP 1 | Z4 | RED R | EMOVED | IN 1 | PARTIAL R**2 0.6495 | R**2 0.6495 | | |
| | | | | SYS=JTI | DS | | | |
| REGRES ERROR TOTAL | SION | | | | MEAN SQUA 0.12106 0.000109 | 586 1102. | | |
| INTERC | ፍውጥ | B V. | ALUE | STD ERROR | TYPE II | SS | F | PROB>F |
| Z1 | 4 | -0.2318 | | 0.01130700 | 0.04614 | 476 420. | 30 | 0.0024 |
| Z 3 | | -0.0166 | | 0.00645848 | 0.000730 | | 65 | 0.1232 |
| STEP 1 2 | ENTE Z1 Z3 | VARIABLI RED RI | e Emoved | NUMBER IN 1 2 | PARTIAL R**2 0.9961 0.0030 | MODEL R**2 0.9961 0.9991 | | C(P) |
| | | | | | | | | |

VARIABLE

| | | | V. | WKIW | مدي م | | | | |
|------------|------------|-----|------------|-------|-------------|--------------------|-------|----------|------------------|
| | S | EP | ENTERE | D | REMOVED | F | | PROB>F | |
| | | 1 | 7.1 | | | F 762.5651 | | 0.0001 | |
| | | 2 | Z3 | | | 6.6502 | | 0.1232 | |
| | | L | 22 | | | 0.0302 | | 0.1232 | |
| | | | | | SYS=LA | NNAV | | | |
| | | | DF | SIM | OF SOUNDES | MENN COLL | יאסגי | ল | מארשט מ |
| RECRES | CTON | | 1 | DON | 0. 40052225 | MEAN SQU | 225 | 40204 40 | 0 0001 |
| ERROR | DION | | 5 | | 0.40032223 | 0.40052 0.00000 | 006 | 40204.49 | 0.0001 |
| TOTAL | | | 6 | | 0.00004361 | 0.00000 | 990 | | |
| TOTAL | | | ь | | 0.40057206 | | | | |
| | | | B VALUI | E | STD ERROR | TYPE II | SS | F | PROB>F |
| INTERC | EPT | 0. | 64554446 | 5 | | | | | |
| Z1 | | -0. | 1222007 | 7 | 0.00060945 | 0.40052 | 225 | 40204.49 | 0.0001 |
| | | | | | | | | | 0.0001 |
| | | VAF | RIABLE | | NUMBER | PARTIAL R**2 | | MODEL | |
| STEP | ENTE | RED | REMO! | ÆD | IN | R**2 | | R**2 | C(P) |
| 1 | Z 1 | | | | 1 | 0.9999 | 0 | .9999 | 303.121 |
| | | | | | | | | | |
| | | | | | SYS=LA | NTARP | | | |
| | | | DF | SUM | OF SQUARES | MEAN SQU | ARE | F | PROB>F |
| REGRES | STON | | 2 | ~ | n 32598915 | 0.16299 | 457 | 97008 88 | 0 0001 |
| ERROR | | | Ā | | 0.02000013 | 0.10255 | 160 | 37000.00 | 0.0001 |
| TYPAT. | | | 6 | | 0.00000072 | 0.00000 | 100 | | |
| IOIAL | | | O | | 0.32333367 | | | | |
| | | | B VALUE | | STD ERROR | TYPE II | SS | F | PROB>F |
| INTERC | ept | 0. | 43874654 | } | | | | | |
| Z1 | | -0. | 10971994 | | 0.00026818 | 0.281236 | 695 | 99999.99 | 0.0001 |
| Z4 | | | | | | 0.000198 | | | |
| | | *** | 7 3 DF D | | 1770000 | | | | |
| | | VAK | I ABLE | | NUMBER | PARTIAL | | MODEL | |
| _ | | RED | REMOV | ED | IN | R**2 | | R**2 | C(P) |
| 1 | Z1 | | | | 1 | R**2 0.9994 | 0 | .9994 | 209.118 |
| 2 | Z4 | | | | 2 | 0.0006 | 1 | .0000 | 5.949 |
| | | | V A | RIAB | î.e | | | | |
| | ST | EP | ENTERED | | | F | | DBUB/E | |
| | | 1 | Z1 | | (41014) | 7940.7559 | | 0.0001 | |
| | | | Z4 | | | 118.0914 | | 0.0001 | |
| | | 4 | 44 | | | 110.0914 | | 0.0004 | |
| | | | | | SYS≈LAN | VTREC | | | |
| | | | DE | OI 64 | 00.000.00 | | | _ | |
| DEVENDE | 17.031 | | | | OF SQUARES | MEAN SQUA | RE | F | PROB>F 0.0001 |
| REGRESS | TON | | 1 | | 0.14785176 | 0.147851 | | 758.78 | 0.0001 |
| ERROR | | | 3 | 1 | 0.00058456 | 0.000194 | 185 | | |
| TOTAL | | | 4 | ı | 0.14843632 | | | | |
| | | | מוניוגיו ב | | CALL EDDOC | man to | | _ | BB05: = |
| T NATIONAL | aDun | -0 | 34649331 | | STU ERKOR | TYPE II | 33 | F | PROB>F |
| Z1 | | | | | 0 00530443 | A 4480F- | 7. | 750 50 | 0.000 |
| 41 | | -0. | T423627 \ | l | 0.00528443 | 0.147851 | . /6 | 758.78 | 0.0001 |

| STEP 1 | ente Z1 | | RIABLE REMO | | NUMBER IN 1 | PARTIAL R**2 0.9961 | | R**2 | C(P) |
|-----------------|------------|------------|----------------|-------|----------------------------------|---------------------------|-----|--------|----------|
| C.3.4 | - Hel | icor | oter Pro | gram | <u>s</u> | | | | |
| | | | | | SYS=HH- | -52 | | | |
| | | | | | | -52 | | | |
| | | | DF | SUM | OF SQUARES | MEAN SOU | ARE | F | PROB>F |
| REGRES | SSION | | 1 | | OF SQUARES 0.13405924 0.00282571 | 0.13405 | 924 | 189.77 | 0.0002 |
| ERROR | | | 4 | | 0.00282571 | 0.00070 | 643 | | |
| TOTAL | | | 4 5 | | 0.13688495 | | | | |
| | | | B VALII | R | STD ERROR | TYPE II | SS | F | PROB>F |
| INTERC | יויפת | | 0384906 | | 212 24404 | | | - | LIGENI |
| Z 4 | | | | | 0.00903591 | 0.13405 | 924 | 189.77 | 0.0002 |
| | | VAF | RIABLE | | NUMBER | PARTIAL | М | ODEL | |
| STEP | ENTE | | | | IN | R**2 | | | C(P) |
| 1 | | _ | | | | 0.9794 | | | |
| | | | | | | | | | |
| | | | | | SYS=CH- | -46 | | | |
| | | | DF | SUM | OF SQUARES | MEAN SQU | ARE | F | PROB>F |
| REGRES | SION | | 2 | | 1.26216747 | 0.63108 | 374 | 75.38 | 0.0002 |
| ERROR | | | 5 7 | | 0.04186031 | 0.00837 | 206 | | |
| TOTAL | | | 7 | | 1.30402778 | | | | |
| | | | n valu | ē: | STD ERROR | TYPE II | SS | F | PROB>F |
| INTERC | EPT | | 9140569 | | | | | - | t KOD/ I |
| Z1 | | -0. | 1280000 | 3 | 0.03385284 | 0.11969 | 126 | 14.30 | 0.0129 |
| Z 2 | | -0. | 29649699 | • | 0.07233527 | 0.14066 | 073 | 16.80 | 0.0094 |
| | | | | | | | | | |
| | 7 | /ARI | ABLE | | NUMBER | PARTIAL | MO | DEL | |
| STEP | ENTER | XED | REMO | ÆD | IN | R**2 | | | |
| 1 | Z 2 | | | | 1 | 0.8761 | 0. | 8761 | 8.24418 |
| 2 | Z1 | | | | 2 | 0.0918 | 0. | 9679 | 1.17264 |
| | | | | | | | | | |
| | | | | ARIA | | _ | | | |
| | STE | _ | ENTERE |) | REMOVED | F | | PROB>F | |
| | | 1 | Z2 | | | 42.4314 | | 0.0006 | |
| | | 2 | Z1 | | | 14.2965 | | 0.0129 | |
| | | | | | SYS≈H-5 | 3 | | | |
| | | | מע | CI N/ | OE COLUEDES | MENNI COLL | NDE | | DD02/ 5 |
| DEVCDE | CION | | DF | SUM | OF SQUARES 0.36413891 | | | F | |
| REGRES ERROR | PION | | 1 | | 0.03876051 | | | 56.37 | 0.0003 |
| TOTAL | | | 7 | | 0.40289942 | 0.00646 | 200 | | |
| TOTAL | | | , | | 0.70207742 | | | | |

| T A HERENIA | TOTOM. | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
|---|-------------------|--|---|---|--|--|
| | | 2.07266030 -0.14183982 | 0.01889225 | 0.36413891 | 56.37 | 0.0003 |
| | | | | PARTIAL | | |
| STEP | ENTE | RED REMOVED | IN | R**2 0.9038 | R**2 | C(P) |
| 1 | Z1 | | 1 | 0.9038 | 0.9038 | -0.85056 |
| | | | SYS=CH- | 47 | | |
| | | DF SU | 4 OF COURTE | MENN COLINDE | r | DDOBVE |
| REGRES | STON | 2 | 0 95253232 | MEAN SQUARE 0.47626616 | 43.60 | 0 0001 |
| ERROR | 51011 | 2 9 11 | 0.09832239 | 0.01092471 | 43.00 | 0.0001 |
| TOTAL | | 11 | 1.05085471 | 0.01032471 | | |
| TOTAL | | 1.1 | 1.050003471 | | | |
| | | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| | EPT | 2.68400939 | | | | |
| Z1 | | -0.11827591 | 0.02135363 | 0.33516543 | 30.68 | 0.0004 |
| Z 2 | | -0.22206813 | 0.03636441 | 0.40740777 | 37.29 | 0.0002 |
| | | VARTARI.E | NI IMPEP | PARTIAL | MODET. | |
| ਵਧਾਜ਼ਾਣ | ENTER | RED REMOVED | IN | D##? | D**2 | C(P) |
| 1 | Z2 | | 1 | R**2 0.5875 | 1 5075 | 23 1105 |
| 2 | Z1 | | 2 | 0.3189 | 0.3073 | 1.0564 |
| 2 | 41 | | Z | 0.3109 | 7.5004 | 1.0564 |
| | | VARIZ | | | | |
| | ST | ep entered | REMOVED | F | PROB>F | |
| | | 1 ~~ | | | | |
| | | 1 22 | | 14.2419 | 0.0036 | |
| | | 2 21 | | 14.2419 30.6796 | | |
| | | 2 Z1 | | | 0.0004 | |
| | | 2 21 | SYS=H-5 | 30.6796 4 | 0.0004 | |
| | | 2 21 | SYS=H-5 | 30.6796 4 | 0.0004 | |
| REGRES | | 2 Z1 DF SUM | SYS=H-5 1 OF SQUARES 0.18000333 | 30.6796 4 MEAN SQUARE 0.18000333 | 0.0004 | |
| ERROR | | 2 Z1 DF SUN 1 3 | SYS=H-5 1 OF SQUARES 0.18000333 0.05167528 | 30.6796 4 | 0.0004 | |
| | | 2 Z1 DF SUN 1 3 | SYS=H-5 1 OF SQUARES 0.18000333 | 30.6796 4 MEAN SQUARE 0.18000333 | 0.0004 | |
| ERROR | | 2 Z1 DF SUN 1 3 4 | OF SQUARES 0.18000333 0.05167528 0.23167861 | 30.6796 4 MEAN SQUARE 0.18000333 0.01722509 | 0.0004 F 10.45 | PROB>F 0.0481 |
| ERROR TOTAL | | DF SUN 1 3 4 B VALUE | SYS=H-5 1 OF SQUARES 0.18000333 0.05167528 | 30.6796 4 MEAN SQUARE 0.18000333 | 0.0004 | |
| ERROR TOTAL INTERC | | DF SUN 1 3 4 B VALUE 1.76204133 | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR | 30.6796 4 MEAN SQUARE 0.18000333 0.01722509 TYPE II SS | 0.0004 F 10.45 | PROB>F 0.0481 PROB>F |
| ERROR TOTAL | | DF SUN 1 3 4 B VALUE | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR | 30.6796 4 MEAN SQUARE 0.18000333 0.01722509 | 0.0004 F 10.45 | PROB>F 0.0481 PROB>F |
| ERROR TOTAL INTERC | | DF SUM 1 3 4 B VALUE 1.76204133 -0.15447484 VARIABLE | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 NUMBER | 30.6796 4 MEAN SQUARE 0.18000333 0.01722509 TYPE II SS 0.18000333 PARTIAL | 0.0004 F 10.45 F 10.45 | PROB>F 0.0481 PROB>F |
| ERROR TOTAL INTERC | SION EPT | DF SUN 1 3 4 B VALUE 1.76204133 -0.15447484 VARIABLE | SYS=H-5- 1 OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 NUMBER IN | 30.6796 4 MEAN SQUARE 0.18000333 0.01722509 TYPE II SS 0.18000333 PARTIAL | 0.0004 F 10.45 F 10.45 | PROB>F 0.0481 PROB>F |
| ERROR TOTAL INTERC Z1 | SION EPT | DF SUM 1 3 4 B VALUE 1.76204133 -0.15447484 VARIABLE | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 NUMBER | 30.6796 4 MEAN SQUARE 0.18000333 0.01722509 TYPE II SS 0.18000333 PARTIAL R**2 | 0.0004 F 10.45 F 10.45 | PROB>F 0.0481 PROB>F 0.0481 |
| ERROR TOTAL INTERC Z1 STEP 1 | SION EPT ENTER | DF SUN 1 3 4 B VALUE 1.76204133 -0.15447484 VARIABLE REMOVED | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 NUMBER IN 1 | 30.6796 4 MEAN SQUARE 0.18000333 0.01722509 TYPE II SS 0.18000333 PARTIAL R**2 0.7770 0 | 0.0004 F 10.45 F 10.45 MODEL R**2 .7770 | PROB>F 0.0481 PROB>F 0.0481 C(P) |
| ERROR TOTAL INTERC Z1 STEP 1 | SION EPT ENTER | DF SUN 1 3 4 B VALUE 1.76204133 -0.15447484 VARIABLE REMOVED | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 NUMBER IN 1 | 30.6796 4 MEAN SQUARE 0.18000333 0.01722509 TYPE II SS 0.18000333 PARTIAL R**2 | 0.0004 F 10.45 F 10.45 MODEL R**2 .7770 | PROB>F 0.0481 PROB>F 0.0481 C(P) |
| ERROR TOTAL INTERC Z1 STEP 1 | SION EPT ENTER | DF SUM 1 3 4 B VALUE 1.76204133 -0.15447484 VARIABLE ED REMOVED | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 NUMBER IN 1 | 30.6796 4 MEAN SQUARE 0.18000333 0.01722509 TYPE II SS 0.18000333 PARTIAL R**2 0.7770 0 | 0.0004 F 10.45 F 10.45 MODEL R**2 .7770 | PROB>F 0.0481 PROB>F 0.0481 C(P) |
| ERROR TOTAL INTERC Z1 STEP 1 | SION EPT ENTER Z1 | DF SUM 1 3 4 B VALUE 1.76204133 -0.15447484 VARIABLE ED REMOVED | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 NUMBER IN 1SYS=HH-6 | 30.6796 4 MEAN SQUARE 0.18000333 0.01722509 TYPE II SS 0.18000333 PARTIAL R**2 0.7770 0 50D MEAN SQUARE 0.02391011 | 0.0004 F 10.45 F 10.45 MODEL R**2 .7770 | PROB>F 0.0481 PROB>F 0.0481 C(P) |
| ERROR TOTAL INTERC Z1 STEP 1 | SION EPT ENTER Z1 | DF SUM 1 3 4 B VALUE 1.76204133 -0.15447484 VARIABLE ED REMOVED DF SUM | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 NUMBER IN 1 | 30.6796 4 MEAN SQUARE 0.18000333 0.01722509 TYPE II SS 0.18000333 PARTIAL R**2 0.7770 0 50D MEAN SQUARE 0.02391011 | 0.0004 F 10.45 F 10.45 MODEL R**2 .7770 | PROB>F 0.0481 PROB>F 0.0481 C(P) |

| | | B VALU | | R TYPE | II SS F | PROB>F |
|--------------|------------|-------------------------|---------------|------------|----------------|---------|
| | | 2.3051891 -0.0506446 | | 0 0.000 | 71690 99999.99 | 0.0001 |
| Z2 | | -0.0588639 | 98 | | 40194 99999.99 | 0.0001 |
| z 3 | | -0.0007121 | | | 05455 99999.99 | 0.0001 |
| | | | | | | |
| | | VARIABLE | | PARTIAL | MODEL | |
| STEP | | red remo | | R**2 | R**2 | C(P) |
| 1 | Z2 | | 1 | | 0.9785 | • |
| 2 | Z1 | | 2 | 0.0207 | | • |
| 3 | Z 3 | | 3 | 0.0008 | 1.0000 | • |
| | | Ţ | ARIABLE | | | |
| | ST | ep entere | | F | PROB>F | |
| | | 1 Z2 | | 91.1672 | | |
| | | 2 Z1 | | 27.2272 | | |
| | | 3 Z3 | | 9999.9999 | | |
| | | • • • | | 333343333 | 310002 | |
| | | | SYS=S | H-3 | | |
| | | DF | SUM OF SQUARE | es mean so | QUARE F | PROB>F |
| REGRES | STON | 1 | | | 43167 24.60 | |
| ERROR | 22011 | 7 | 0.0914754 | | | 0.0020 |
| TOTAL | | 8 | 0.4129070 | | | |
| | | • | | | | |
| | | B VALU | | R TYPE | II SS F | PROB>F |
| INTERC | EPT | 1.4941664 | | | | |
| Z1 | | -0.1580620 | 0.0318703 | 0.3214 | 13167 24.60 | 0.0016 |
| | | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP | ENTE | RED REMO | OVED IN | R**2 | R**2 | C(P) |
| 1 | Z1 | | 1 | 0.7785 | 0.7785 | 0.00725 |
| | | | | | | |
| <u>c.3.5</u> | - Tac | tical Armam | ent Programs | | | |
| | | | | | | |
| | | | SYS=L | LLGB | | |
| | | DF | SUM OF SQUARE | | | PROB>F |
| REGRES | SION | 1 | 0.7177216 | 3 0.7177 | 2163 3753.30 | 0.0001 |
| ERROR | | 8 | 0.0015297 | 9 0.0001 | .9122 | |
| TOTAL | | 9 | 0.7192514 | 2 | | |
| | | | | | | |
| | | B VALU | E STD ERRO | R TYPE I | I SS F | PROB>F |
| INTERC | EPT | -2.5106106 | | | | |
| Z1 | | -0.1703481 | 3 0.0027805 | 5 0.7177 | 2163 3753.30 | 0.0001 |
| | | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP | ENTE | | | R**2 | R**2 | C(P) |
| 1 | Z1 | | 1 | 0.9979 | 0.9979 | 1.11880 |
| | - | | _ | | | — |

| | | | | sys=cem | | | |
|-------------|------------|---|--------|--------------------------|---|----------------|--------------|
| | | | O1 94 | OT COLLEGE | MEDAL COLLA | RE F | PROB>F |
| | | DF | SUM | OF SQUARES | 1.181850 | | 0.0001 |
| RECRESSIO | N | 2 | | 2.36370132 | 0.006525 | | 0.0001 |
| ERROR | | 5 7 | | 0.03262793 2.39632925 | 0.006525 | J J | |
| TOTAL | | 7 | | 2.39632925 | | | |
| INTERCEPT | -1 | B VALU | | STD ERROR | TYPE II | SS F | PROB>F |
| 72 72 | | .3059109 | | 0.01679777 | 2.164243 | 99 331.66 | 0.0001 |
| Z4 | | .0008311 | | 0.00032751 | 0.042021 | | 0.0520 |
| 47 | · · | .0000311 | • | 0.00002.02 | *************************************** | | |
| | VA | RIABLE | | NUMBER | PARTIAL | MODEL | |
| STEP EN | TERED | REMO | VED | IN | R**2 | R**2 0.9688 | C(P) |
| 1 Z2 | | | | 1 | 0.9688 | 0.9688 | 46.3232 |
| 2 Z4 | | | | 2 | 0.0175 | 0.9864 | 19.9954 |
| | | 17 | יגדמגי | of G | | | |
| | CHIMOLO | | ARIAI | REMOVED | F 196 6073 | PROB>F | |
| | STEP | | U | KENOVED | 186.6073 | 0.0001 | |
| | 1 | Z2 | | | 100.00/3 | | |
| | 2 | Z4 | | | 6.4395 | 0.0520 | |
| | | | | SYS=GBU | J-15 | | |
| | | DF | CI IM | OF SQUARES | MEAN SQUA | RE F | PROB>F |
| DDCDDGGT C | A 7 | | | 0.09760238 | | 38 8.61 | |
| REGRESSIO | MIN | 1 | | 0.07931718 | 0.037802 | | 0.0213 |
| ERROR | | 7 | | 0.17691956 | 0.011331 | .03 | |
| TOTAL | | 8 | | 0.1/631336 | | | |
| | | B VALU | E | STO ERROR | TYPE II | SS F | PROB>F |
| INTERCEPT | | .2361267 | | | | | |
| Z 2 | -0 | .1083826 | 0 | 0.03692870 | 0.097602 | 38 8.61 | 0.0219 |
| | VA | RIABLE | | NUMBER | PARTIAL | MODEL | |
| STEP EN | | REMO | | IN | | R**2 | C(P) |
| 1 22 | | 10210 | | 1 | | 0.5517 | |
| | | | | | | | |
| C.3.6 - T | actic | al Missi | le P | roqrams | | | |
| | | | | SYS=AMR | 7.AM | | |
| | | | | 519-WI | CLANTI I | | |
| | | DF | SUM | OF SQUARES | MEAN SQUA | | PROB>F |
| REGRESSIO | N | 1 | | 3.86655114 | 3.866551 | 14 7317.93 | 0.0001 |
| ERROR | | 8 | | 0.00422694 | 0.000528 | 37 | |
| TOTAL | | 9 | | 3.87077808 | - - | | |
| | | B VALU | ne: | STD ERROR | TYPE II | SS F | PROB>F |
| INTERCEPT | ١ 1 | .6824322 | | DID Education | | | J. Tamer & |
| Z1 | | .3561030 | | 0.00416276 | 3.866551 | 14 7317.93 | 0.0001 |
| | v | , ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | • | | | | - |

| STEP 1 | V ENTERE Z1 | ARIABLE D REMOV | NUMBER ED IN 1 | PARTIAL R**2 0.9989 | MODEL R**2 0.9989 | C(P) -0.29569 |
|---------------------------|---------------------------|--|--|---|---|-------------------------------------|
| | | | SYS=H2 | ¥RM | | |
| REGRES ERROR TOTAL | SION | DF 2 8 10 | SUM OF SQUARES 2.42845988 0.00447246 2.43293234 | 3 1.21422 5 0.00055 | 2994 2171.92 | PROB>F 0.0001 |
| | | B VALUE | STD ERROF | TYPE II | ıss f | PROB>F |
| INTERC Z1 Z2 | - | 0.93266880 0.16383163 0.13846115 | 0.01057877 | | | 0.0001 0.0001 |
| STEP 1 2 | ENTERE Z1 Z2 | ARIABLE D REMOVI | NUMBER ED IN 1 2 | PARTIAL R**2 0.9848 0.0133 | MODEL R**2 0.9848 0.9982 | C(P) 47.7452 1.6368 |
| | | | RIABLE | | | |
| | STEP 1 2 | ENTERED Z1 Z2 | REMOVED | F 584.5267 57.9896 | PROB>F 0.0001 0.0001 | |
| | | | sys=11 | R | | |
| REGRES ERROR TOTAL | SION | DF 5 3 5 8 | SUM OF SQUARES 2.66682132 0.03446049 2.70128181 | 0.88894 | 1044 128.98 | PROB>F 0.0001 |
| ******** | | B VALUE | STD ERROR | TYPE II | SS F | PROB>F |
| INTERCI Z1 Z2 Z3 | -(-(| 0.43571126 0.19118490 0.14216161 0.01186183 | 0.05684627 0.08340168 0.00471809 | 0.02002 | 2.91 | 0.0200 0.1490 0.0536 |
| STEP 1 2 3 | ENTEREI Z2 Z1 Z3 | ARIABLE) REMOVE | NUMBER ED IN 1 2 3 | PARTIAL R**2 0.9569 0.0142 0.0161 | MODEL R**2 0.9569 0.9711 0.9872 | C(P) 11.2343 7.8888 3.8092 |
| | | VAR | RIABLE | | | |
| | STEP 1 2 3 | ENTERED 22 21 23 | REMOVED | F 155.5503 2.9455 6.3208 | PROB>F 0.0001 0.1369 0.0536 | |

| | | SYS=AIM | 7F-R | | |
|------------|-------------|--------------|-------------|--------|---------|
| | ne cil | OF SQUARES | MEAN SQUARE | F | PROB>F |
| PPOPEGGION | DF SUM | 3.46681704 | 1.15560568 | 571.32 | 0.0001 |
| RECRESSION | 3 4 | 0.00809078 | 0.00202270 | 312.32 | 0,000 |
| ERROR | 7 | 3.47490783 | 0.00202270 | | |
| TOTAL | , | 3.47430763 | | | |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| INTERCEPT | 1.69969019 | | | | |
| Z1 | -0.31468519 | 0.03890963 | 0.13230278 | | 0.0013 |
| Z 2 | -0.18254365 | 0.07192420 | 0.01302909 | | 0.0641 |
| 24 | -0.00583438 | 0.00320354 | 0.00670905 | 3.32 | 0.1427 |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP ENTE | | IN | R**2 | R**2 | C(P) |
| 1 21 | | 1 | | 0,9902 | 8.68830 |
| 2 22 | | 2 | | 0.9957 | 3.50675 |
| 3 Z4 | | 3 | | 0.9977 | 3.01043 |
| 3 44 | VARIA | - | 3.772 | | |
| CT | TEP ENTERED | REMOVED | F | PROB>F | |
| 51 | 1 21 | | 605.4055 | 0.0001 | |
| | 2 22 | | 6.5207 | 0.0510 | |
| | 3 Z4 | | 3.3169 | 0.1427 | |
| | | | | | |
| | | Sys=aim | 17F-GD | | |
| | DF SUM | OF SQUARES | MEAN SQUARE | F | PROB>F |
| REGRESSION | 1 | 4.95424289 | 4.95424289 | 237.69 | 0.0001 |
| ERROR | 4 | 0.08337301 | 0.02084325 | | |
| TOTAL | 5 | 5.03761591 | | | |
| | | | | | |
| | B VALUE | STO ERROR | TYPE II SS | F | PROB>F |
| INTERCEPT | 1.04508899 | | | | |
| Z1 | -0.46191702 | 0.02996112 | 4.95424289 | 237.69 | 0.0001 |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP ENTE | | IN | R**2 | R**2 | C(P) |
| 1 21 | | 1 | | 0.9834 | 0.32703 |
| ~ 0- | | - | | | |

C.4 - Modified Alternative Two Stepwise Regression

This section contains the summary results produced by the stepwise regression procedure in SAS. The SAS program used to produce this run was discussed in Appendix B.4.

C.4.1 - Bomber Aircraft Programs

| | ~-~ | SYS=B-1 | B | | |
|----------------|--------------------------|--------------|----------------|-------------|---|
| | DF SUM | OF SOUARES | MEAN SOUARE | ন | PROBSE |
| REGRESSION | 1 | 1.47808272 | 1.47808272 | 1837.90 | 0.0001 |
| ERROR | 3 | 0.00241268 | 0.00080423 | | *************************************** |
| TOTAL | DF SUM 1 3 4 | 1.48049540 | | | |
| | | | | | |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| INTERCEPT | 6.06180789 | | | | |
| Z1 | -0.31029881 | 0.00723802 | 1.47808272 | 1837.90 | 0.0001 |
| | | | | | |
| comple parting | VARIABLE ERED REMOVED | NUMBER | PARTIAL | MODEL | (T/D) |
| 51EP ENT | EKED KEMOVED | 1 1 1 1 | N**7 | K**Z | C(P) |
| 1 41 | | 1 | 0.9984 | 0.9984 | • |
| | | SYS=B-5 | 2 | | |
| | | | | _ | |
| | DF SUM 1 8 9 | OF SQUARES | MEAN SQUARE | F | PROB>F |
| REGRESSION | Ţ | 0.98951441 | 0.98951441 | 10.54 | 0.0118 |
| ERROR | 8 | 0.75101711 | 0.09387714 | | |
| TOTAL | 9 | 1.74053152 | | | |
| | B VALUE | 9770 PDD00 | WYDE II CC | 1 2 | DDOD/E |
| TNTTERCTOR | 4.66879195 | SID ERROR | 1166 11 22 | r | PROB/F |
| 7.1 | -0.21690646 | 0 06680998 | D 98951441 | 10 54 | 0 0118 |
| | 0.22030030 | 0.00000330 | 0.50551441 | 10.54 | 0.0110 |
| | VARIABLE ERED REMOVED | NUMBER | PARTIAL | MODEL | |
| STEP ENTE | ERED REMOVED | IN | R**2 | R**2 | C(P) |
| 1 21 | | 1 | 0.5685 | 0.5685 | -1.49368 |
| | | SYS=B-56 | 8 | | |
| | | | | | |
| NO VARIABLE | ES MET THE 0.150 | O SIGNIFICAN | CE LEVEL FOR E | MTRY INTO T | HE MODEL. |
| | | | | | |
| C.4.2 - Fig | hter Aircraft P | rograms | | | |
| | | SYS=A-1(|) | | |
| | | | | | |
| | | of squares | MEAN SQUARE | | PROB>F |
| REGRESSION | 1 | 0.18748236 | 0.18748236 | 7.22 | 0.0312 |
| ERROR | 7 | 0.18166422 | 0.02595203 | | |
| TOTAL | 8 | 0.36914658 | | | |
| | | - | | <u>-</u> - | |
| 7.1 | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| INTERCEPT | 2.41566916 | 0.00016336 | 0 10740000 | 7 00 | 0.0310 |
| Z2 | -0.00043912 | 0.00016338 | 0.18748236 | 7.22 | 0.0312 |

| STEP ENT 1 Z2 | VARIABLE TERED REMOVED | IN | | R**2 | C(P) -1.47809 |
|------------------------------|--|--|---|-----------------------------------|----------------------------|
| | | sys=F-1 | 00 | | |
| ERROR | DF SUM 1 1 3 4 | 0.51333658 0.01618481 | MEAN SQUARE 0.51333658 0.00539494 | 95.15 | PROB>F 0.0023 |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| INTERCEPT 21 | 2.18648143 -0.15830979 | | | | |
| STEP ENT 1 Z1 | VARIABLE ERED REMOVED | NUMBER IN 1 | PARTIAL R**2 0.9694 | MODEL R**2 0.9694 | C(P) |
| | | SYS=F-1 | 01 | | |
| RECRESSION ERROR TOTAL | DF SUM | | MEAN SQUARE 0.92472428 0.01328796 | | |
| INTERCEPT | B VALUE 3.32628329 | | | | |
| Z1 | -0.25635237 | 0.03072985 | 0.92472428 | 69.59 | 0.0011 |
| STEP ENT | VARIABLE ERED REMOVED | IN | PARTIAL R**2 0.9456 (| R**2 | |
| | | SYS=F-1(|)2~ | | |
| REGRESSION ERROR TOTAL | | OF SQUARES 1.49040707 0.00000000 1.49040707 | MEAN SQUARE 0.49680236 0.00000000 | F 99999.99 | PROB>F 0.0001 |
| INTERCEPT 21 23 | B VALUE 3.48150418 -0.40736132 0.00000014 | STD ERROR 0 0 | TYPE II SS 0.81537812 0.00511276 | 99999.99 | PROB>F 0.0001 0.0001 |
| 24 | -0.00095772 | 0 | 0.00006041 | 99999.99 | 0.0001 |
| STEP ENT 1 21 2 23 3 24 | VARIABLE ERED REMOVED | NUMBER IN 1 2 3 | 0.0208 | MODEL R**2 0.9792 1.0000 | C(P) |

| | VARIA | ABLE | | | |
|---|---------------------------|------------|---|--------|---------|
| ទា | 1 Z1 2 Z3 | | F 94.0561 512.6888 | 0.0281 | |
| | 3 Z4 | | 9999.9999 | 0.0001 | |
| | | SYS=F-1 | .06 | | |
| | DF SUM | OF SQUARES | MEAN SQUARE 1.19964727 0.03912402 | F | PROB>F |
| REGRESSION | 1 | 1.19964727 | 1.19964727 | 30.66 | 0.0311 |
| ERROR | 2 | 0.07824803 | 0.03912402 | | |
| ERROR TOTAL | 1 2 3 | 1.27789530 | | | |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| | 4.79595764 -0.49884822 | 0 09008726 | 1 19964727 | 30.66 | 0.0311 |
| <i>2</i> | | | | | 0.0311 |
| | | | PARTIAL | | |
| | RED REMOVED | | | | C(P) |
| 1 21 | | 1 | 0.9388 | 0.9388 | • |
| | | sys=F-1 | 5AB | | |
| | DIE SIN | OF COURTS | mean square | r r | DBUB/E |
| NO TOP STORY | 1 | 0 15260233 | 0 15260233 | 146.05 | 0 0003 |
| ERROR | 4 | 0.13200233 | 0.13200233 | 140.03 | 0.0003 |
| TOTAL | 5 | 0.15678176 | 0.0010100 | | |
| | D 1137.183 | dan babab | mon II co | 10 | חרטט/ פ |
| 7 5 MT (2017) (70 70 70 70 70 70 70 70 70 70 70 70 70 7 | | STO ERROR | TYPE II SS | r | PROB>F |
| | 3.52762254 -0.13148161 | 0.01007050 | 0 15260222 | 146 05 | 0.0003 |
| 41 | -0.13140101 | 0.01007939 | 0.15260255 | 140.00 | 0.0003 |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP ENTE | RED REMOVED | IN | R**2 0.9733 | R**2 | C(P) |
| 1 21 | | 1 | 0.9733 | 0.9733 | • |
| | | SYS=F-1 | 5CD | ~~~~~ | |
| | | | | | |
| | | OF SQUARES | MEAN SQUARE | F | PROB>F |
| REGRESSION | 4 | 0.11878998 | 0.02969750 | 60.87 | 0.0033 |
| ERROR | 3 | 0.00146372 | 0.000487 <u>91</u> | | |
| TOTAL | 7 | 0.12025370 | | | |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| INTERCEPT | 0.58701319 | | | | |
| Z1 | 0.62615186 | 0.06423618 | 0.04635932 | 95.02 | 0.0023 |
| 22 | -0.00858822 | 0.00105195 | 0.03252027 | 66.65 | 0.0038 |
| Z 3 | 0.00007899 | 0.00001050 | 0.02758857 | 56.54 | 0.0049 |
| 25 | 0.11367418 | 0.01626840 | 0.02382162 | 48.82 | 0.0060 |
| | | | | | |

| STEP 1 2 3 4 5 | ENTE Z2 Z4 Z1 Z3 Z5 | | IABLE REMO | VED | NUMBER IN 1 2 3 4 5 | PARTIAL R**2 0.5476 0.1826 0.1286 0.0908 0.0385 0.0003 | 0. 0. 0. 0. | 10DEL R**2 5476 7302 8589 9496 9881 9878 | 43.4975 23.8057 |
|----------------|------------------------------------|--------|---------------|------|---------------------------------------|---|----------------------|---|--------------------|
| | | | v | ARIA | BLE | | | | |
| | รา | ΈP | | D | REMOVED | F | | PROB>F | |
| | | 1 | Z2 | | | 7.2632 | | 0.0358 | |
| | | 2 3 | Z4 Z1 | | | 3.3850 | | 0.1252 0.1289 | |
| | | | Z1 Z3 | | | 3.6448 5.4068 | | | |
| | | | 25 25 | | | 6.4951 | | | |
| | | 6 | 20 | | Z4 | 0.0530 | | | |
| | | | | | | | | | |
| | | | | | SYS=F-1 | .5E | | | |
| | | | DF | SUM | OF SQUARES | MEAN SO | UARE | F | PROB>F |
| RECRES | SION | | 1 | | 0.03589868 | 0.0358 | 9868 | 13.64 | 0.0210 |
| ERROR | | | 4 | | 0.01053040 | 0.0026 | | | |
| TOTAL | | | 5 | | 0.04642908 | | | | |
| INTERC | EPT | | B VALU | | STD ERROR | TYPE I | I SS | F | PROB>F |
| Z 3 | | -0. | 0000044 | 6 | 0.00000121 | 0.0358 | 9868 | 13.64 | 0.0210 |
| | | VARI | ABLE | | NUMBER | PARTIAL. | MO | DET. | |
| STEP | ENTE | RED | REMO | VED | TNI | ロナナク | | D**7 | C(P) |
| 1 | | | | | 1 | 0.7732 | 0. | 7732 | 1.59749 |
| | | | | | SYS=F-1 | 6AB | | | |
| | | | | | 210 1 1 | .0125 | | | |
| | | | | SUM | OF SQUARES | MEAN SQU | JARE | F | PROB>F |
| REGRES | SION | | 1 | | 0.29665823 | 0.2966 | 5823 | 12.19 | 0.0397 |
| ERROR | | | 3 | | 0.07301787 | 0.0243 | 3929 | | |
| TOTAL | | | 4 | | 0.36967609 | | | | |
| INTERC | ept | 1.8 | B VALU | | STD ERROR | TYPE I | SS | F | PROB>F |
| Z4 | | 0.3 | 1276447 | 0 | 0.03656188 | 0.2966 | 5823 | 12.19 | 0.0397 |
| | | VAR1 | ABLE | | NUMBER | PARTIAL | М | ODEL | |
| STEP | ENTE | | REMO' | | IN | R**2 | | | C(P) |
| 1 | Z4 | | - | - | 1 | 0.8025 | | | • |
| | | | | | SYS=F-1 | 6 F2 . | | | |
| | | | | | 919=b-1 | 0E | | | |

NO VARIABLES MET THE 0.1500 SIGNIFICANCE LEVEL FOR ENTRY INTO THE MODEL.

C.4.3 - Electronics Programs

| ~~~~~~ | | SYS=ARC | -109V | | |
|--------------|---|---------------|-----------------|--------------|----------|
| | DF SUM | OF SQUARES | mean square | দ | PROB>F |
| REGRESSION | 1 | | | 14.23 | 0.0326 |
| ERROR | 3 | | 0.01148997 | | 0.0020 |
| TOTAL | 4 | 0.19798445 | 0102210337 | | |
| | | | | | |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| INTERCEPT | -2.99345507 | | | | |
| Z1 | -0.09510960 | 0.02521190 | 0.16351455 | 14.23 | 0.0326 |
| | VARTARTE | NI IMPER | ΡΑΡΨΤΑΓ. | MODET. | |
| STREE FINTE | VARIABLE ERED REMOVED | TN | D**2 | P**2 | C(P) |
| 1 21 | | 1 | R**2 0.8259 | 0.8259 | |
| | | _ | 0.0233 | 0.0233 | • |
| | | SYS=ARC- | -54 | | |
| | DF SUM | OF SOLIARES | MEAN SOLIARE | ធ | DROB>F |
| RECERESSION | 1 | 0 11782452 | MEAN SQUARE | 69 37 | 0 0004 |
| FRROR | Š | 0.11702332 | 0 00169848 | 03.37 | 0.0004 |
| TOTAL. | 1 5 6 | 0.00043241 | 0.00103040 | | |
| IOIAL | U | 0.12931033 | | | |
| | R VALUE | STO FRECO | TYPE II SS | F | DROBAR |
| INTERCEPT | -3.18672110 | 510 B GK | 1110 11 00 | • | t KOD/I |
| | -0.12274020 | 0 01473668 | 0 11782452 | 69 37 | 0.0004 |
| 0 2 | 0.122/3020 | 0.014/5000 | 0.11702432 | 03.37 | 6.0004 |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP ENTE | RED REMOVED | IN | R**2 | R**2 | C(P) |
| 1 Z1 | | 1 | 0.9328 | 0.9328 | 98.0531 |
| | · · · · · · · · · · · · · · · · · · · | sys=asn- | -63 | | |
| NO UNDINDEE | S MET THE 0.1500 |) CICNIETONIC | FO COO YOU'S OF | in court vom | TE MODET |
| WO VAINTADDE | | SIGNIFICAN | | AIRI INIO IN | E MODEL. |
| | و الله عليه الله عليه فيه الله الله عليه الله عليه الله عليه الله عليه الله الله الله | sys=asn- | -70 | | |
| | DF SUM | of squares | MEAN SQUARE | F | PROB>F |
| REGRESSION | 2 | 0.02702549 | 0.01351275 | 5.55 | 0.0538 |
| ERROR | 5 | 0.01217836 | 0.00243567 | | |
| TOTAL | 7 | 0.03920385 | | | |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| INTERCEPT | -3.20442829 | | | • | 11,02,1 |
| Z2 | -0.00046417 | 0.00015919 | 0.02070889 | 8.50 | 0.0332 |
| Z 3 | 0.00000146 | 0.00000061 | 0.01411101 | 5.79 | 0.0611 |
| | 210000110 | 0.0000001 | O.OTATITOT | 3.13 | O.OOLL |

| STEP 1 2 | ENTE Z2 Z3 | | IABLE REMOVE | | PARTIAL R**2 0.3294 0.3599 | MODEL R**2 0.3294 0.6894 | C(P) 18.1826 8.2759 |
|--------------------------|------------------|---------|-----------------|---------------|-------------------------------------|---|---------------------------|
| | | | VAR | IABLE | | | |
| | ST | FID OLD | ENTERED | REMOVED | F | PROB>F | |
| | | 1 | 72 | | 2.9475 | 0.1368 | |
| | | 2 | Z3 | | 5.7935 | 0.0611 | |
| | | • | 23 | | 411,700 | *************************************** | |
| | | | | sys=asn | 1-99 | | |
| | | | | | | | |
| | | j | of s | JM OF SQUARES | MEAN SQUA | ARE F | PROB>F |
| REGRES | NOIS | | 2 | 0.24600823 | 0.12300 | 412 8.32 | 0.0256 |
| ERROR | | | 5 | 0.07389455 | 0.01477 | 891 | |
| TOTAL | | | 7 | 0.31990278 | | | |
| | | | | | | | |
| | | | B VALUE | STD ERROR | TYPE II | SS F | PROB>F |
| INTERC | EPT | -3. | 44823854 | | | | |
| 21 | | 0. | 10330948 | 0.04664951 | 0.07248 | 174 4.90 | 0.0777 |
| Z 3 | | -0. | 00000112 | 0.00000036 | 0.14281 | 158 9 <i>.</i> 66 | 0.0266 |
| | | | | | | | |
| | | VAR | IABLE | NUMBER | PARTIAL | MODEL | |
| STEP | ENTE | RED | REMOVE | O IN | R**2 | R**2 | C(P) |
| 1 | Z 3 | | | 1 | 0.5424 | 0.5424 | 17.2355 |
| 2 | Z1 | | | 2 | 0.2266 | 0.7690 | 8.7202 |
| _ | | | VAR | ABLE | | | |
| | ST | EIP | ENTERED | REMOVED | F | PROB>F | |
| | | 1 | Z 3 | | 7.1129 | 0.0372 | |
| | | 2 | Z1 | | 4.9044 | 0.0777 | |
| | | | | | | | |
| | | | | sys=asn | I-108 | | |
| | | | | | | | |
| | | i | | JM OF SQUARES | MEAN SQU | | PROB>F |
| REGRES | SION | | 1 | 0.11931741 | 0.11931 | | 0.0298 |
| ERROR | | | 3 | 0.02348470 | 0.007828 | 323 | |
| TOTAL | | | 4 | 0.14280211 | | | |
| | | | | | | | |
| | | | B VALUE | STD ERROR | TYPE II | SS F | PROB>F |
| INTERC | EPT | | 91448159 | | | | |
| Z1 | | -0.0 | 09411975 | 0.02410798 | 0.11931 | 741 15.24 | 0.0298 |
| | | | | | | | |
| | | | IABLE | NUMBER | PARTIAL | MODEL | |
| STEP | ENTER | RED | REMOVE | | R**2 | R**2 | C(P) |
| 1 | Z1 | | | 1 | 0.8355 | 0.8355 | • |
| | | | | | | | |
| | | | | SYS=ASQ | 1-133 | | |
| | | | | | | | 2222 |
| | | • | ن نار | | | | |
| Describe | CTC+ | ſ | | M OF SQUARES | | | |
| REGRES | SION | [| 2 | 0.29373628 | 0.146868 | 314 40.47 | |
| REGRES ERROR TOTAL | SION | [| | | 0.146868 | 314 40.47 | |

| INTERCEPT | B VALUE -0.41860430 | STD ERROR | TYPE II SS | F | PROB>F |
|--|---|---|---|---|--|
| 72 23 | -0.41880430 -0.00317744 0.00002187 | 0.00084376 0.00001040 | 0.05146323 0.01605538 | | 0.0328 0.1262 |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| | CRED REMOVED | | R**2 | R**2 | C(P) |
| 1 22 | | 1 | 0.9116 0 | | • |
| 2 23 | | 2 | 0.0527 0 | .9643 | • |
| | VARI | ABLE | | | |
| នា | | REMOVED | F | PROB>F | |
| | 1 22 | | 41.2264 | 0.0030 | |
| | 2 Z 3 | | 4.4243 | 0.1262 | |
| | | sys=asw | ' -32 | | |
| | DF SU | M OF SQUARES | MEAN SQUARE | F | PROB>F |
| REGRESSION | | | 0.21856871 | 5.03 | 0.0883 |
| ERROR | | | 0.04344989 | | |
| TOTAL | 5 | 0.39236828 | | | |
| INTERCEPT | B VALÚE -1.32228292 | STD ERROR | TYPE II SS | F | PROB>F |
| 21 | -0.14043494 | 0.06261459 | 0.21856871 | 5.03 | 0.0883 |
| | | | | | |
| step ente | VARIABLE RED REMOVED | NUMBER IN | R**2 | R**2 | C(P) |
| STEP ENTE | | | | R**2 | C(P) |
| | RED REMOVED | IN 1 | R**2 0.5570 0 | R**2 .5570 | • |
| | RED REMOVED | IN 1 | R**2 | R**2 .5570 | • |
| | RED REMOVED | IN 1 | R**2 0.5570 0 1035N MEAN SQUARE | R**2 .5570 | PROB>F |
| 1 Z1 | RED REMOVED DF SUI | IN 1 SYS=CP- 1 OF SQUARES 0.06927195 | R**2 0.5570 0 1035N MEAN SQUARE 0.06927195 | R**2 .5570 | PROB>F |
| 1 Z1 REGRESSION ERROR | DF SUI | IN 1 SYS=CP- 1 OF SQUARES 0.06927195 0.02654941 | R**2 0.5570 0 1035N MEAN SQUARE | R**2 .5570 | PROB>F |
| 1 Z1 | RED REMOVED DF SUI | IN 1 SYS=CP- 1 OF SQUARES 0.06927195 | R**2 0.5570 0 1035N MEAN SQUARE 0.06927195 | R**2 .5570 | PROB>F |
| 1 Z1 REGRESSION ERROR | DF SUI | IN 1 SYS=CP- 1 OF SQUARES 0.06927195 0.02654941 | R**2 0.5570 0 1035N MEAN SQUARE 0.06927195 0.00663735 | R**2 .5570 F 10.44 | PROB>F 0.0320 |
| 1 Z1 REGRESSION ERROR TOTAL INTERCEPT | DF SUI 1 4 5 5 B VALUE -2.01397140 | IN 1 SYS=CP- 1 OF SQUARES 0.06927195 0.02654941 0.09582136 STD ERROR | R**2 0.5570 0 1035N MEAN SQUARE 0.06927195 0.00663735 TYPE II SS | R**2 .5570 | PROB>F 0.0320 PROB>F |
| 1 Z1 RECRESSION ERROR TOTAL | DF SUI 1 4 5 5 B VALUE -2.01397140 | IN 1 SYS=CP- 1 OF SQUARES 0.06927195 0.02654941 0.09582136 STD ERROR | R**2 0.5570 0 1035N MEAN SQUARE 0.06927195 0.00663735 | R**2 .5570 | PROB>F 0.0320 PROB>F |
| 1 Z1 REGRESSION ERROR TOTAL INTERCEPT | DF SUM 1 4 5 B VALUE -2.01397140 -0.06879717 | IN 1 SYS=CP- 4 OF SQUARES 0.06927195 0.02654941 0.09582136 STD ERROR 0.02129557 | R**2 0.5570 0 1035N MEAN SQUARE 0.06927195 0.00663735 TYPE II SS 0.06927195 | F 10.44 | PROB>F 0.0320 PROB>F |
| 1 Z1 RECRESSION ERROR TOTAL INTERCEPT Z5 | DF SUI 1 4 5 5 B VALUE -2.01397140 | IN 1 SYS=CP- 4 OF SQUARES 0.06927195 0.02654941 0.09582136 STD ERROR 0.02129557 NUMBER | R**2 0.5570 0 1035N MEAN SQUARE 0.06927195 0.00663735 TYPE II SS | R**2 .5570 F 10.44 F 10.44 | PROB>F 0.0320 PROB>F |
| 1 Z1 RECRESSION ERROR TOTAL INTERCEPT Z5 | DF SUI 1 4 5 B VALUE -2.01397140 -0.06879717 VARIABLE | IN 1 SYS=CP- 4 OF SQUARES 0.06927195 0.02654941 0.09582136 STD ERROR 0.02129557 NUMBER IN | R**2 0.5570 0 1035N MEAN SQUARE 0.06927195 0.00663735 TYPE II SS 0.06927195 PARTIAL | R**2 .5570 F 10.44 F 10.44 MODEL R**2 | PROB>F 0.0320 PROB>F 0.0320 |
| 1 Z1 RECRESSION ERROR TOTAL INTERCEPT Z5 STEP ENTE | DF SUI 1 4 5 B VALUE -2.01397140 -0.06879717 VARIABLE RED REMOVED | IN 1 SYS=CP- 1 OF SQUARES 0.06927195 0.02654941 0.09582136 STD ERROR 0.02129557 NUMBER IN 1 | R**2 0.5570 0 1035N MEAN SQUARE 0.06927195 0.00663735 TYPE II SS 0.06927195 PARTIAL R**2 0.7229 0 | F 10.44 MODEL R**2 .7229 | PROB>F 0.0320 PROB>F 0.0320 |
| 1 Z1 RECRESSION ERROR TOTAL INTERCEPT Z5 STEP ENTE | DF SUI 1 4 5 B VALUE -2.01397140 -0.06879717 VARIABLE RED REMOVED | IN 1 SYS=CP- 1 OF SQUARES 0.06927195 0.02654941 0.09582136 STD ERROR 0.02129557 NUMBER IN 1 | R**2 0.5570 0 1035N MEAN SQUARE 0.06927195 0.00663735 TYPE II SS 0.06927195 PARTIAL R**2 | F 10.44 MODEL R**2 .7229 | PROB>F 0.0320 PROB>F 0.0320 |
| 1 Z1 RECRESSION ERROR TOTAL INTERCEPT Z5 STEP ENTE 1 Z5 | DF SUI 1 4 5 B VALUE -2.01397140 -0.06879717 VARIABLE RED REMOVED | IN 1 SYS=CP 1 OF SQUARES 0.06927195 0.02654941 0.09582136 STD ERROR 0.02129557 NUMBER IN 1 SYS=JTIM 1 OF SQUARES | R**2 0.5570 0 1035N MEAN SQUARE 0.06927195 0.00663735 TYPE II SS 0.06927195 PARTIAL R**2 0.7229 0 DS MEAN SQUARE | R**2 .5570 F 10.44 F 10.44 MODEL R**2 .7229 | PROB>F 0.0320 PROB>F 0.0320 C(P) |
| 1 Z1 RECRESSION ERROR TOTAL INTERCEPT Z5 STEP ENTE 1 Z5 RECRESSION | DF SUI 1 4 5 B VALUE -2.01397140 -0.06879717 VARIABLE RED REMOVED DF SUI 2 | IN 1 SYS=CP 1 OF SQUARES 0.06927195 0.02654941 0.09582136 STD ERROR 0.02129557 NUMBER IN 1 SYS=JTIME 1 OF SQUARES 0.24224975 | R**2 0.5570 0 1035N MEAN SQUARE 0.06927195 0.00663735 TYPE II SS 0.06927195 PARTIAL R**2 0.7229 0 DS MEAN SQUARE 0.12112488 | R**2 .5570 F 10.44 F 10.44 MODEL R**2 .7229 | PROB>F 0.0320 PROB>F 0.0320 C(P) |
| 1 Z1 RECRESSION ERROR TOTAL INTERCEPT Z5 STEP ENTE 1 Z5 | DF SUI 1 4 5 B VALUE -2.01397140 -0.06879717 VARIABLE RED REMOVED | IN 1 SYS=CP 1 OF SQUARES 0.06927195 0.02654941 0.09582136 STD ERROR 0.02129557 NUMBER IN 1 SYS=JTIM 1 OF SQUARES | R**2 0.5570 0 1035N MEAN SQUARE 0.06927195 0.00663735 TYPE II SS 0.06927195 PARTIAL R**2 0.7229 0 DS MEAN SQUARE | R**2 .5570 F 10.44 F 10.44 MODEL R**2 .7229 | PROB>F 0.0320 PROB>F 0.0320 C(P) |

| | | _ | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
|-------------|-----------|--------|----------------------|------------|----------------|------------------|---------|
| INTERC | EPT | | 26033430 | 0.00534897 | 0 00002222 | 1735.21 | 0.0006 |
| Z1 Z4 | | | 22281625 01362598 | 0.00334037 | | | |
| 43 | | 0. | 01302330 | 0.00337033 | 0.00001010 | 10.01 | 0.0301 |
| | | VAR | IABLE | NUMBER | PARTIAL | MODEL | |
| STEP | ENTE | RED | REMOVED | IN | R**2 | R**2 | C(P) |
| 1 | Z1 | | | 1 | 0.9961 | 0.9961 | • |
| 2 | Z4 | | | 2 | 0.0035 | 0.9996 | • |
| | | | VARIA | BLE | | | |
| | ST | EP | ENTERED | REMOVED | F | PROB>F | |
| | | 1 | Z1 | | 762.5651 | 0.0001 | |
| | | 2 | 24 | | 16.3446 | 0.0561 | |
| | | | | | | | |
| | | | | SYS=LA | NNAV | | |
| | | 1 | DF SUM | OF SQUARES | | | |
| REGRES | SSION | | | 0.40055971 | 0.20027985 | 64829.71 | 0.0001 |
| ERROR | | | | 0.00001236 | 0.00000309 | | |
| TOTAL | | | 6 | 0.40057206 | | | |
| | | | D WALLES | STD ERROR | TYPE II SS | F | PROB>F |
| T NITTED (| ነው ውጥ | | B VALUE 64140172 | SID ERROR | TIPE II SS | F | FROD/F |
| Z1 | | | 11867768 | 0.00106724 | 0 03820152 | 12365.66 | 0.0001 |
| Z2 | | | 00002120 | 0.00000609 | | | 0.0253 |
| <i>-</i> 22 | | • | 00002120 | 0.0000000 | 0.00000710 | 24,25 | 0.0200 |
| | | | IABLE | | | | |
| STEP | | RED | REMOVED | IN | R**2 | | C(P) |
| 1 | Z1 | | | 1 | 0.9999 | | 122.687 |
| 2 | Z2 | | | 2 | 0.0001 | 1.0000 | 30.181 |
| | om | | VARIA | | 5 7 | DD0D/ H | |
| | ST | | ENTERED | REMOVED | F 9999.9999 | PROB>F 0.0001 | |
| | | 1 2 | Z1 Z2 | | 12.1235 | 0.0001 | |
| | | 4 | 42 | | 12.1233 | 0.0255 | |
| | | | | SYS=LAI | VTARP | | |
| | | _ | | on some | | | |
| 00000 | | I | | OF SQUARES | MEAN SQUARE | | PROB>F |
| REGRES | SION | | 2 | 0.32598975 | 0.16299487 | | 0.0001 |
| FRROR | | | 4 | 0.00000612 | 0.00000153 | | |
| TOTAL | | | 6 | 0.32599587 | | | |
| | | | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| INTERC | EPT | 0.4 | 43874661 | | | | |
| Z1 | | -0.1 | 10972822 | 0.00025555 | 0.28193572 | 99999.99 | 0.0001 |
| Z 5 | | 0.0 | 00009616 | 0.00000843 | 0.00019902 | 130.15 | 0.0003 |
| | | UADI | TABLE | NUMBER | PARTIAL | MODEL | |
| STEP | ENTE | | REMOVED | IN | R**2 | R**2 | C(P) |
| 1 | Z1 | مين | | 1 | | 0.9994 | 71.8489 |
| 2 | 25 | | | 2 | | 1.0000 | 1.2318 |
| - | | | | - | | | |

VARIABLE

| | VARIA | BLE | | | |
|------------------|--------------------|------------|--------------------------|--------------------|--------|
| ST | EP ENTERED | REMOVED | F | PROB>F | |
| | EP ENTERED 1 21 | | 7940.7559 | 0.0001 | |
| | 2 Z 5 | | 130.1470 | | |
| | | | | 2 | |
| | | SYS=LAN | TREC | | |
| | | | | | |
| | | | MEAN SQUAR | | |
| RECRESSION | 1 | 0.14785176 | 0.1478517 | 6 .758 . 78 | 0.0001 |
| ERROR | 3 | 0.00058456 | 0.0001948 | 5 | |
| TOTAL | 3 4 | 0.14843632 | | | |
| | B VALUE | STO ERROR | TYPE II S | a 2 | PROB>F |
| T NAMES CANDAIN | -0.34649331 | DID DECOR | 11.0 11 0 | | INODAL |
| | -0.14556527 | 0.00528443 | 0 1478517 | 5 759 78 | 0.0001 |
| 21 | ~0.14556527 | 0.0032043 | 0.1470317 | 0 730.70 | 0.0001 |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP ENTE | RED REMOVED | IN | R**2 0.9961 | R**2 | C(P) |
| 1 Z1 | | 1 | 0.9961 | 0.9961 | • |
| | | | | | |
| C A A - Hel | icopter Program | . | | | |
| 0.1.1 1101 | reopect rrogram | <u> </u> | | | |
| | | SYS=HH- | ·52 | | |
| | | 0.00 | | | |
| | DF SUM | OF SQUARES | MEAN SQUARI 0.0681130 | E F | PROB>F |
| REGRESSION | 2 | 0.13622601 | 0.0681130 | 310.10 | 0.0003 |
| ERROR | 3 | 0.00065894 | 0.00021969 | 5 | |
| TOTAL | 5 | 0.13688495 | | | |
| | | | | | |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| | 0.04459178 | | | | |
| 24 | | | | | |
| Z 5 | 0.14651552 | 0.00984815 | 0.04861639 | 221.34 | 0.0007 |
| | VARIABLE | NI MORO | DADMIAI | MODET | |
| COURSES TO STATE | | | | | C(P) |
| STEP ENTER | RED REMOVED | 10 | K^^Z | | C(P) |
| 1 Z5 | | | 0.9379 | | • |
| 2 24 | | 2 | 0.0572 | 0.9952 | • |
| | VARIA | DT F | | | |
| ST | | | F | PROB>F | |
| 31. | | KEROVED | _ | 0.0015 | |
| | 1 Z5 | | 60.4616 | | |
| | 2 Z4 | | 35.6714 | 0.0094 | |
| | | SYS=CH- | 46 | | |
| | | | | | |
| | DF SUM | OF SQUARES | | E F | PROB>F |
| REGRESSION | 2 | 1.22477069 | | | 0.0009 |
| ERROR | 5 | 0.07925709 | | | |
| TOTAL | 7 | 1.30402778 | | | |
| | | · - | | | |

| T NEWCODA | TOTOM | B VALUE 2.42191179 | STD ERROR | TYPE II S | ss F | PROB>F |
|-----------|------------|-----------------------|---|----------------|----------|----------|
| | | | 0 02020206 | 1 2174040 | 00 76 01 | 0 0000 |
| | | | 0.03039306 | | 76.81 | |
| 44 | | -U.U343463L | 0.01345674 | 0.1032639 | 6.51 | 0.0511 |
| | | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP | ENTE | RED REMOVE | | | | C(P) |
| 1 | Z1 | | | 0.8600 | | |
| 2 | Z4 | | 2 | | 0.9392 | |
| _ | | | _ | 0.0.2 | 0,7072 | 0.30012 |
| | | | IABLE | | | |
| | ST | | REMOVED | F 36.8672 | PROB>F | |
| | | 1 Z1 | | 36.8672 | 0.0009 | |
| | | 2 Z4 | | 6.5145 | 0.0511 | |
| | | | | | | |
| | | | SYS=H-5 | 3 | | |
| | | DF SU | JM OF SOUARES | MEAN SOUAR | E F | PROB>F |
| REGRES | SION | 1 | JM OF SQUARES 0.36413891 0.03876051 | 0.3641389 | 56.37 | 0.0003 |
| ERROR | | 6 | 0.03876051 | 0.0064600 | 8 | |
| TOTAL | | 6 7 | 0.40289942 | | • | |
| | | | | | | |
| | | B VALUE | STD ERROR | TYPE II S | S F | PROB>F |
| | | 2.07266030 | | | | |
| Z1 | | -0.14183982 | 0.01889225 | 0.3641389 | 1 56.37 | 0.0003 |
| | | | | | | |
| | | VARIABLE | NUMBER | PARTIAL | MODEL | |
| | | RED REMOVED |) IN | R**2 0.9038 | R**2 | C(P) |
| 1 | Z1 | | 1 | 0.9038 | 0.9038 | -0.67396 |
| | | | SYS=CH- | 47 | | |
| | | | | | | |
| | | DF SU | im of squares | MEAN SQUAR | E F | PROB>F |
| REGRES | SION | 3 | | 0.3153283 | | 0.0002 |
| ERROR | | 8 | | 0.0131087 | 0 | |
| TOTAL | | 11 | 1.05085471 | | | |
| | | B VALUE | STD ERROR | TYPE II S | s F | PROB>F |
| INTERC | TOTO | 1.98150621 | SID EMMOR | TIPE II S | o r | PROBA |
| Z1 | THE I | -0.07590720 | 0.02686504 | 0.1046527 | 3 7.98 | 0.0223 |
| Z2 | | -0.00176284 | 0.00051800 | 0.1518217 | | |
| Z3 | | 0.00000688 | 0.00031800 | | | 0.0093 |
| 43 | | 0.00000000 | 0.00000302 | 0.0678895 | 0 5.18 | 0.0524 |
| | | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP | ENTE | RED REMOVED | | R**2 | R**2 | C(P) |
| 1 | Z2 | | 1 | 0.6285 | 0.6285 | 15.0366 |
| 2 | Z1 | | $\ddot{2}$ | 0.2071 | 0.8356 | 4.1956 |
| 3 | Z 3 | | 3 | 0.0646 | 0.9002 | 2.1890 |
| | | | - | | | 212000 |

| | VARIA | BLE | | | |
|------------------------------|--------------------------------------|--|--|--------------------------------------|------------------|
| sı | TEP ENTERED 1 | REMOVED | F 16.9213 11.3352 5.1790 | PROB>F 0.0021 0.0083 0.0524 | |
| | | SYS=H-5 | 4 | | |
| | | 222 31 3 | • | | |
| RECRESSION ERROR TOTAL | 1 3 | OF SQUARES 0.18000333 0.05167528 0.23167861 | 0.1800033 | E F 3 10.45 | PROB>F 0.0481 |
| T NATIONAL CHEMOLITY | B VALUE 1.76204133 | STD ERROR | TYPE II S | s f | PROB>F |
| | -0.15447484 | 0.04778574 | 0.1800033 | 3 10.45 | 0.0481 |
| STEP ENTE | VARIABLE RED REMOVED | IN | | R**2 | C(P) |
| | | SYS=HH- | 60D | | |
| RECRESSION ERROR TOTAL | | | MEAN SQUAR 0.0691215 0.0013044 | | |
| ፣ ለጣፍው ሶፍውጥ | B VALUE 2.23770674 | STO ERROR | TYPE II S | s F | PROB>F |
| Z1 | -0.08690880 | 0.01193889 | 0.0691215 | 3 52.99 | 0.0184 |
| STEP ENTE | VARIABLE RED REMOVED | IN 1 | R**2 0.9636 | R**2 0.9636 | • |
| | ~ | SYS=SH-: | 3 | | |
| RECRESSION ERROR TOTAL | DF SUM 1 7 8 | OF SQUARES 0.32143167 0.09147543 0.41290709 | MEAN SQUARE 0.3214316 0.01306792 | 7 24.60 | PROB>F 0.0016 |
| INTERCEPT Z1 | B VALUE 1.49416647 -0.15806200 | STD ERROR 0.03187031 | TYPE II SS | | PROB>F |
| STEP ENTER | VARIABLE RED REMOVED | NUMBER IN 1 | PARTIAL R**2 0.7785 | MODEL R**2 0.7785 | C(P) 5.71821 |

C.4.5 - Tactical Armament Programs

| | | | | | SYS=LLI | LGB | | | |
|------------|---|------|-------------------|------|----------------|----------|------|---------|---------|
| | | 1 | DF | SUM | OF SQUARES | MEAN SO | UARE | F | PROB>F |
| REGRE | SSION | | 1 | | 0.71772163 | 0.7177 | 2163 | 3753.30 | 0.0001 |
| ERROR | | | 8 | | 0.00152979 | | | | |
| TOTAL | | | 9 | | 0.71925142 | • | | | |
| | | | B VALU | E | STD ERROR | TYPE I | I SS | F | PROB>F |
| INTER | EPT | -2. | 5106106 | | | | | _ | |
| Z1 | | | 1703481 | | 0.00278055 | 0.7177 | 2163 | 3753.30 | 0.0001 |
| | | | IABLE | | NUMBER | | | | |
| STEP | ENTE | RED | REMO | VED | IN | R**2 | | R**2 | C(P) |
| 1 | Z1 | | | | 1 | 0.9979 | C | .9979 | 2.88405 |
| | | | | | SYS=C <u>e</u> | 1 | | | |
| | | r | DF | SUM | OF SQUARES | MEAN SO | TARE | F | PROB>F |
| REGRES | STON | • | | | | | | | |
| ERROR | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | 5 | | 0.01125073 | 0.0022 | | 323.30 | 0.0001 |
| TOTAL | | | ž | | 2.39632925 | 0.0022 | JU13 | | |
| IOIAL | | | , | | 2.0002020 | | | | |
| INTERC | ጥዊଙ | | B VALU 7214437 | | STD ERROR | TYPE I | I SS | F | PROB>F |
| Z1 | | | 2276455 | | 0.00726387 | 2 2100 | N293 | 982.16 | 0.0001 |
| Z4 | | | 0068705 | | 0.00125462 | | | 29.99 | 0.0028 |
| | | VAR1 | ABLE | | NUMBER | PARTIAL | | MODET. | |
| STEP | ENTE | RED | REMO | VED | IN | R**2 | | R**2 | C(P) |
| 1 | Z1 | | | | 1 | 0.9671 | | | 86.1819 |
| 2 | Z4 | | | | 2 | 0.0282 | | .9953 | 10.8874 |
| | | | | | | 3.0302 | | .,,,,, | 2010071 |
| | | | | ARIA | | _ | | | |
| | ST | | ENTERE | , | REMOVED | F | | PROB>F | |
| | | 1 | Z1 | | | 176.6261 | | 0.0001 | |
| | | 2 | Z4 | | | 29.9884 | | 0.0028 | |
| | | | | | SYS=GBU- | 15 | | ~~~~~~ | |
| | | ם | F | SUM | OF SQUARES | mean squ | JARE | F | PROB>F |
| REGRES | SION | _ | 2 | | 0.15959725 | 0.07979 | | 27.64 | 0.0009 |
| ERROR | | | 6 | | 0.01732231 | 0.00288 | | 2,.03 | 0.0005 |
| TOTAL | | | 8 | | 0.17691956 | -10020 | | | |
| | | | B VALUE | • | STD ERROR | MVDE *1 | | - | DD022 C |
| INTERC | TCTOTT | | | | atu banca | TYPE II | 35 | F | PROB>F |
| Z2 | ce i | | 64399316 | | 0.00005466 | 0 1265 | 261 | 45.00 | 0 0005 |
| | | | 0037584 | | 0.00005466 | 0.13651 | | 47.28 | 0.0005 |
| Z 3 | | U.U | 0000051 | • | 800000008 | 0.11268 | 5652 | 39.03 | 0.0008 |

| STEP 1 2 3 4 | ENTE 21 23 22 | VARIABL RED R Z | EMOVED | NUMBER IN 1 2 3 2 | PARTIAL R**2 0.5313 0.2023 0.1725 0.0040 | R 0.5 0.7 0.9 | **2 313 336 060 021 | C(P) 19.3822 10.8608 3.8875 2.0935 |
|--------------------------|------------------------|-----------------------|-------------|----------------------------------|---|------------------------|---------------------------------|--|
| | | | VARIA | BLE | | | | |
| | ST | EP ENT | | REMOVED | F | | PROB>F | |
| | | 1 Z1 | | | 7.9351 | | 0.0259 | |
| | | 2 Z3 | | | 4.5544 | | 0.0768 | |
| | | 3 Z2 | | 01 | 9.1799 | | 0.0291 | |
| | | 4 | | 21 | 0.2107 | | 0.6655 | |
| C.4.6 | - Taci | tical Mi | ssile Pr | cograms | | | | |
| | | | | | | | | |
| | | | | SYS=AMR | AAM | | | |
| | | DF | SUM | OF SQUARES | MEAN SO | I IAPE | F | PROB>F |
| REGRES | SION | 1 | 5011 | 3.86655114 | | | 7317.93 | |
| ERROR | | 8 | | 0.00422694 | | | | ***** |
| TOTAL | | 9 | | 3.87077808 | ı | | | |
| | | | | | | | | |
| | | | | STD ERROR | TYPE I | I SS | F | PROB>F |
| INTERC | ep'r | 1.6824 | | 0 00416006 | 2 0565 | | 7217 62 | 0 0001 |
| Z1 | | -0.3561 | 0306 | 0.00416276 | 3.8665 | 5114 | 7317.93 | 0.0001 |
| | | VARIABLI | Ξ | NUMBER | PARTIAL | MO | DEL | |
| STEP | ENTER | | MOVED | IN | R**2 | R | **2 | C(P) |
| 1 | Z1 | | | 1 | 0.9989 | 0.9 | 989 | -0.08448 |
| | | | | <i></i> | | | | |
| ~~~~ | | | | SYS=HA | KM | | | |
| | | DF | SUM | OF SQUARES | Mean sq | UARE | F | PROB>F |
| REGRES | SION | 3 | | 2.42365888 | | | 609.83 | 0.0001 |
| ERROR | | 7 | | 0.00927346 | 0.0013 | 2478 | | |
| TOTAL | | 10 | | 2.43293234 | | | | |
| | | B V | ALUE | STD ERROR | TYPE I | T SS | F | PROB>F |
| INTERCE | PT. | 0.66544 | | | 1112 | - 55 | - | 1100/1 |
| Z1 | | -0.25136 | | 0.00654520 | 1.9538 | 6405 | 1474.86 | 0.0001 |
| Z4 | | -0.01712 | 2223 | 0.00377179 | 0.0273 | 0046 | 20.61 | 0.0027 |
| 25 | | 0.00726 | 5288 | 0.00249397 | 0.0112 | 3516 | 8.48 | 0.0226 |
| | | VARIABLE | 7 | NUMBER | PARTIAL | MOI | DEL. | |
| STEP | ENTER | | EMOVED | IN | R**2 | | **2 | C(P) |
| 1 | Z1 | | . IV T 1111 | 1 | 0.9848 | 0.9 | - | 67.2061 |
| 2 | Z4 | | | $\tilde{2}$ | 0.0067 | 0.99 | | 36.2519 |
| 3 | Z 5 | | | 2 3 | 0.0046 | 0.99 | | 15.6530 |
| | | | | | | | | |

| | _ | _ | • | _ | _ | |
|----|---|---|---|---|---|--|
| VΔ | ø | T | Δ | ы | | |

| | | | VAR | IA | | | | | |
|------------|--------------|-----|-------------|-----|------------|----------|------|----------------|---------|
| | ST | EΡ | ENTERED | | REMOVED | F | | PROB>F | |
| | | 1 | Z1 | | | 584.5267 | | 0.0001 | |
| | | 2 | Z4 | | | 6.3908 | | 0.0354 | |
| | | 3 | Z 5 | | | 8.4808 | | | |
| | | 3 | 45 | | | 0.4008 | | 0.0226 | |
| | | | | | SYS=IIF | } | | ~ | |
| | | | | | 3.5 | • | | | |
| | | | | | OF SQUARES | MEAN SO | UARE | F | PROB>F |
| REGRES | SION | | 3 | | 2.67262986 | 0.8908 | | | 0.0001 |
| ERROR | | | 5 | | 0.02865195 | 0.0057 | 3039 | | |
| TOTAL | | | 8 | | 2.70128181 | | | | |
| | | | B VALUE | | STD ERROR | TYPE I | T SS | F | PROB>F |
| TANTIEDO | ሚ ፈንጥ | Λ | 11061786 | | DID LEGION | 111.0 1 | | r. | LICODYL |
| | | | | | 0.01447600 | 0.0000 | | 205 40 | 0 0001 |
| Z1 | | | 28493477 | | 0.01447628 | 2.2200 | | 387.42 | 0.0001 |
| Z4 | | | 02671880 | | 0.00716121 | 0.0797 | | | 0.0136 |
| Z 5 | | 0. | 00404648 | | 0.00218778 | 0.0196 | 0351 | 3.42 | 0.1236 |
| | | VAR | IABLE | | NUMBER | PARTIAL | | MODEL | |
| STEP | ENTER | | REMOVE | D | | | | | C(P) |
| 1 | Z1 | | | _ | 1 | 0 9474 | | R**2 0.9474 | 13 7801 |
| 2 | Z4 | | | | 2 | 0.3474 | | 0.9821 | 3.3729 |
| 3 | | | | | 3 | | | | |
| 3 | 25 | | | | 3 | 0.0073 | | 0.9894 | 2.7839 |
| | | | VAR | IAF | BLE | | | | |
| | STE | P | ENTERED | | | F | | PROB>F | |
| | | 1 | Z1 | | | 125.9713 | | 0.0001 | |
| | | 2 | Z4 | | | 11.6813 | | 0.0142 | |
| | | 3 | Z 5 | | | 3.4210 | | 0.1236 | |
| | | _ | | | | 311220 | | 0.1200 | |
| | | | | | sys=aim7 | F-R | | | |
| | | | DF SI | м | OF SQUARES | MEAN SO | UARE | ਜ | PROBSE |
| REGRES | STON | | 2 | | 3.45875409 | 1 7293 | 7705 | 535 29 | 0 0001 |
| ERROR | 22011 | | 5 | | 0.01615374 | 0.0032 | | 333.23 | 0.0001 |
| TOTAL | | | 2 5 7 | | 3.47490783 | 0.0032 | 3075 | | |
| IOIAL | | | , | | 3.4/490/63 | | | | |
| | | | B VALUE | | STD ERROR | TYPE I | I SS | F | PROB>F |
| INTERC | ept – | 1. | 23402235 | | | | | | |
| Z1 | | -0. | 41251857 | | 0.01376895 | 2.8999 | 3692 | 897.61 | 0.0001 |
| Z4 | | | 01447367 | | 0.00614091 | 0.0179 | | 5.56 | 0.0650 |
| . | | ٠. | 0111/30/ | | 0.00014031 | 0.01/3 | 7/11 | 3.30 | 0.0000 |
| - | | | IABLE | | NUMBER | PARTIAL | | MODEL | |
| STEP | ENTER | ED | REMOVE |) | IN | R**2 | | R**2 | C(P) |
| 1 | Z1 | | | | 1 | 0.9902 | (| 0.9902 | 1073.29 |
| 2 | Z4 | | | | 2 | 0.0052 | (| .9954 | 508.32 |
| | | | VARI | ΔP | I.E | | | | |
| | STE | Þ | ENTERED | | REMOVED | F | | PROB>F | |
| | | 1 | Z1 | | | _ | | | |
| | | 2 | | | | 605.4055 | | 0.0001 | |
| | | ۷ | 24 | | | 5.5551 | | 0.0650 | |

| | | SYS=AIM7 | F-GD | | |
|----------------------------|--------------------------------|--|---|-------------------------|------------------|
| REGRESS: ERROR TOTAL | DF ION 1 4 5 | SUM OF SQUARES 4.95424289 0.08337301 5.03761591 | MEAN SQUARE 4.95424289 0.02084325 | 237.69 | PROB>F 0.0001 |
| INTERCE | B VAL | | TYPE II SS | F | PROB>F |
| Z1 | -0.461917 | | 4.95424289 | 237.69 | 0.0001 |
| | VARIABLE ENTERED REMO 21 | NUMBER OVED IN 1 | PARTIAL R**2 0.9834 | MODEL R**2 0.9834 | C(P) |

C.5 - Modified Alternative Three Stepwise Regression

This section contains the summary results produced by the stepwise regression procedure in SAS. The SAS program used to produce this run was discussed in Appendix B.5.

C.5.1 - Bomber Aircraft Programs

| | | SYS=B- | 1B | | |
|---------------|-------------|-------------|---------------|----------|---------|
| | | | - | | |
| | DF SUM | OF SQUARES | MEAN SQUARE | F | PROB>F |
| REGRESSION | | 1.47808272 | | | |
| ERROR | 1 3 | 0.00241268 | 0.00080423 | 2007,000 | |
| TOTAL | 4 | 1.48049540 | 0.00000120 | | |
| | - | 2.100.5010 | | | |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| INTERCEPT | 6.06180789 | | 110 11 00 | • | I ROD/I |
| | -0.31029881 | 0.00723802 | 1.47808272 | 1837 90 | 0.0001 |
| 0 1 | 0.51025001 | 0.00723002 | 1.4/0002/2 | 1037.30 | 0.0001 |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP ENTE | | | R**2 | | C(P) |
| 1 71 | RED REMOVED | 1 | 0.9984 0 | | |
| 1 41 | | 1 | 0.5504 0 | . 7704 | 1.63136 |
| | | CV0-D 1 | - | | |
| | | 515=8-: | 02 | | |
| | 00 0184 | OD GOLLADAG | V2377 0013700 | _ | ח יפט |
| DECEDERATION. | | OF SQUARES | | | |
| REGRESSION | 1 | | 0.98951441 | 10.54 | 0.0118 |
| ERROR | 8 9 | | 0.09387714 | | |
| TOTAL | 9 | 1.74053152 | | | |
| | | | | | |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| | 4.66879195 | | | | |
| Z1 | -0.21690646 | 0.06680998 | 0.98951441 | 10.54 | 0.0118 |

| STEP 1 | | | ABLE REMOVE | | NUMBER IN 1 | R** | 2 | R** | *2 | C(P) 0.54747 |
|---------------------------|-------------|-------------------|-------------------------------|------|--|--------------------------|---------------------------|---------------|------------|------------------|
| | | | | | SYS=B-5 | 8 | | | | |
| no var | IABLES | MET | THE 0.1 | .500 | O SIGNIFICANO | E LEVEL | FOR I | INT RY | INTO | THE MODEL. |
| C.5.2 | - Figh | ter A | ircraft | : P | rograms | | | | | |
| | | | | | sys=a-1 | .0 | | | | |
| | | | | |) SIGNIFICANO | | | | | |
| | | | | | SYS=F-10 | 0 | | | | |
| RECRES ERROR TOTAL | SION | 1 | } | | OF SQUARES 0.51333658 0.01618481 0.52952138 | 0.513 | 333658 | 3 | F 95.15 | PROB>F 0.0023 |
| INTERC | EPT | 2.18 | 3 VALUE 1648143 1830979 | | STD ERROR 0.01622930 | | - | | F 95.15 | |
| 1 | ENTER Z1 | ED | REMOVE | D) | 1 | R**2 0.9694 | 2 1 | 0.969 | ·2)4 | C(P) 0.46928 |
| | | | | | SYS=F-10 | 1 | | | | |
| REGRES ERROR TOTAL | SION | DF 1 4 | · s | UM | OF SQUARES 0.92472428 0.05315185 0.97787613 | MEAN 9 0.924 0.013 | QUARE 172428 328796 | E 3 5 | F 69.59 | PROB>F 0.0011 |
| | | E | VALUE | | STD ERROR | TYPE | II SS | 3 | F | PROB>F |
| INTERC | | 3.32 | 628329 635237 | | 0.03072985 | | | | 69.59 | 0.0011 |
| STEP | | | BLE REMOVE | | NUMBER IN 1 | R**2 | ? | R** | 2 | C(P) 0.75666 |
| - | | | | | * | 3.7430 | • | U1734 | . • | J. 75000 |
| | | | | | SYS=F-10 | 2 | | | | |
| REGRES: ERROR TOTAL | SION | DF 1 2 3 | | | OF SQUARES 1.45937506 0.03103201 1.49040707 | 1.459 | 37506 | , | | PROB>F 0.0105 |

| T NUTUCADA | 404.VII) | B VALUE 3.39652787 | STO ERROR | TYPE II S | 5 F | PROB>F |
|---------------------------|------------|--------------------------|--|---|-------------------------|------------------|
| | | | 0.03888328 | 1.4593750 | 94.06 | 0.0105 |
| STEP 1 | ENTE Z1 | VARIABLE ERED REMOVED | | PARTIAL R**2 0.9792 | R**2 | C(P) |
| | | | sys=F-1 | 06 | | |
| RECRES ERROR TOTAL | | 1 2 | OF SQUARES 1.19964727 0.07824803 1.27789530 | MEAN SQUARE 1.1996472 0.03912402 | 30.66 | PROB>F 0.0311 |
| ፣ አነጣናነጋ ር | ranom | B VALUE 4.79595764 | STD ERROR | TYPE II SS | 5 F | PROB>F |
| Z1 | ACAF I | -0.49884822 | 0.09008726 | 1.19964727 | 30.66 | 0.0311 |
| STEP | ENTE 21 | VARIABLE RED REMOVED | NUMBER IN 1 | PARTIAL R**2 0.9388 | MODEL R**2 0.9388 | C(P) |
| | | | SYS=F-1 | 5AB | | |
| ERROR | | 1 4 | 0.15260233 | MEAN SQUARE 0.15260233 0.00104486 | 146.05 | PROB>F 0.0003 |
| INTERC | EPT | B VALUE 3.52762254 | STD ERROR | TYPE II SS | F | PROB>F |
| Z1 | | -0.13148161 | 0.01087959 | 0.15260233 | 146.05 | 0.0003 |
| STEP 1 | ENTE Z1 | VARIABLE RED REMOVED | IN | PARTIAL R**2 0.9733 | R**2 | C(P) 1.13109 |
| | | | SYS=F-15 | 5CD | | |
| REGRES: ERROR TOTAL | SION | DF SUM 1 6 7 | OF SQUARES 0.06145850 0.05879520 0.12025370 | 0.06145850 | 6.27 | PROB>F 0.0463 |
| INTERC | eer Eer | B VALUE 2.60679451 | STD ERROR | TYPE II SS | F | PROB>F |
| 22 | | 0.06093005 VARIABLE | 0.02432965 NUMBER | 0.06145850 PARTIAL | 6.27 MODEL | 0.0463 |
| STEP 1 | ENTE Z2 | RED REMOVED | IN 1 | R**2 0.5111 | R**2 0.5111 | C(P) 1.13138 |

| | | ~ | | sys=F-1 | 5 E - | | | |
|-----------|-------------------|--|-------------------------|---|---|-------------------------------|----------------|---|
| | | DF | SUM | OF SQUARES | MEAN SQU | JARE | F | PROB>F |
| REGRE | SSION | 1 | | 0.03274593 | 0.03274 | 1593 | 9.57 | 0.0364 |
| ERROR | | 4 | | 0.01368315 | 0.00342 | 2079 | | |
| TOTAL | | 5 | | OF SQUARES 0.03274593 0.01368315 0.04642908 | | | | |
| | | B VAL | Æ | STD ERROR | | | | |
| INTER | CEPT | 3.234929 -0.069599 | 40 51 | 0.02249524 | 0.03274 | 593 | 9.57 | 0.0364 |
| | | VARIABLE | | NUMBER | PARTIAL | } | 10DEL | |
| STEP | ENTE | RED REM | OVED | IN | R**2 | | R**2 | C(P) |
| 1 | Z1 | | | NUMBER IN 1 | 0.7053 | 0 | .7053 | 0.30402 |
| | | | | sys=F-16 | 5AB | | | |
| | | DF | SUM | OF SOUARES | MEAN SOU | ARE | F | PROB>F |
| REGRE | SSION | 1 | | 0.28836638 | 0.28836 | 638 | 10.64 | 0.0471 |
| ERROR | | 3 | | 0.08130971 | 0.02710 | 324 | | |
| TOTAL | | 4 | | OF SQUARES 0.28836638 0.08130971 0.36967609 | | | | |
| | | | | | | | | |
| T100000 | | B VALU | Æ | STD ERROR | TYPE II | SS | F | PROB>F |
| INTERO | XPT | -0.228282 | 78 75 | 0.06998603 | 0.28836 | 638 | 10.64 | 0.0471 |
| | | | | | | | | |
| - | TOWN THE P | VAKIABLE | רויים | NUMBER IN | PARTIAL P**2 | ı | 10DEL P**2 | C(D) |
| | | |)VED | T 7.4 | K^^2 | | K^^2 | C(P) |
| STEP 1 | 71 EN1E | KED KERK | | 1 | 0.7801 | Λ | 7801 | ก ธุรการ |
| STEP 1 | Z1 | NEO NEA | | 1 | 0.7801 | 0. | 7801 | 0.53015 |
| 1 | Z1 | | | 1 sys=F-16 | 0.7801 | 0. | 7801 | 0.53015 |
| 1 | Z1 | | | 1 | 0.7801 5E | 0. | .7801 | 0.53015 |
| NO VAE | Z1 RIABLE | S MET THE (| .150 | 1 SYS=F-16 D SIGNIFICANO | 0.7801 5E | 0. | .7801 | 0.53015 |
| NO VAE | Z1 RIABLE | | 0.1500 | 1 SYS=F-16 D SIGNIFICANO | 0.7801 SE SE LEVEL FO | 0. | .7801 | 0.53015 |
| NO VAE | Z1 RIABLE | S MET THE (| 0.1500 | 1 SYS=F-16 D SIGNIFICANO | 0.7801 SE SE LEVEL FO | 0. | .7801 | 0.53015 |
| NO VAE | Z1 RIABLE | S MET THE (| 0.1500 | 1 SYS=F-16 D SIGNIFICANO | 0.7801 SE SE LEVEL FO | 0. | .7801 | 0.53015 |
| NO VAE | Z1 RIABLE - Ele | S MET THE (| 0.1500 | 1 SYS=F-16 D SIGNIFICANO <u>ns</u> SYS=ARC-1 | 0.7801 5E E LEVEL FO .09V MEAN SQU | 0. R ENT | TRY INTO TO | 0.53015 |
| NO VAE | Z1 RIABLE - Ele | S MET THE (ctronics Pr | 0.1500 | 1SYS=F-16 D SIGNIFICANO MSSYS=ARC-1 OF SQUARES | 0.7801 5E E LEVEL FO .09V MEAN SQU | 0. R ENT ARE 455 | TRY INTO TO | 0.53015 HE MODEL. PROB>F |
| NO VAL | Z1 RIABLE - Ele | S MET THE (ctronics Pr | 0.1500 | 1SYS=F-16 D SIGNIFICANO MSSYS=ARC-1 OF SQUARES 0.16351455 | 0.7801 5E E LEVEL FO .09V MEAN SQU 0.16351 | 0. R ENT ARE 455 | TRY INTO TO | 0.53015 HE MODEL. PROB>F |
| NO VAI | Z1 RIABLE - Ele | DF 1 3 4 B VALUE | O.1500 Coqrai SUM | 1SYS=F-16 D SIGNIFICANO SSIGNIFICANO SSIGNIFICANO | 0.7801 5E E LEVEL FO .09V MEAN SQU 0.16351 | 0. R ENT | TRY INTO TO | 0.53015 HE MODEL. PROB>F |
| NO VAI | Z1 RIABLE - Ele | DF 1 3 4 B VALU -2.9934550 | O.1500 Cogran SUM | 1SYS=F-16 D SIGNIFICANO MSSYS=ARC-1 OF SQUARES 0.16351455 0.03446990 0.19798445 STD ERROR | 0.7801 5E E LEVEL FO .09V MEAN SQU 0.16351 0.01148 | 0. R ENT ARE 455 997 SS | F 14.23 | PROB>F 0.53015 |
| NO VAI | Z1 RIABLE - Ele | DF 1 3 4 B VALUE -2.9934550 -0.0951096 | O.1500 Cogran SUM | 1SYS=F-16 D SIGNIFICANO SSIGNIFICANO SSIGNIFICANO | 0.7801 SE E LEVEL FO .09V MEAN SQU 0.16351 0.01148 TYPE II 0.16351 | 0. R ENT ARE 455 997 SS | F 14.23 | PROB>F 0.53015 |
| NO VAR | ZI RIABLE - Ele | DF 1 3 4 B VALC -2.9934550 -0.0951096 | SUM | 1SYS=F-16 D SIGNIFICANO SSIGNIFICANO SSIGNIFICANO SSIGNIFICANO SSIGNIFICANO SYS=ARC-1 OF SQUARES 0.16351455 0.03446990 0.19798445 STD ERROR 0.02521190 NUMBER | 0.7801 E LEVEL FO .09V MEAN SQU. 0.16351 0.01148 TYPE II 0.16351 PARTIAL | 0. R ENT ARE 455 997 SS 455 | F 14.23 MODEL | 0.53015 HE MODEL. PROB>F 0.0326 PROB>F 0.0326 |
| NO VAI | Z1 RIABLE - Ele | DF 1 3 4 B VALC -2.9934550 -0.0951096 | SUM | 1SYS=F-16 D SIGNIFICANO SSIGNIFICANO SSIGNIFICANO | 0.7801 SE E LEVEL FO .09V MEAN SQU 0.16351 0.01148 TYPE II 0.16351 | 0 R ENT ARE 455 997 SS 455 | F 14.23 | PROB>F 0.53015 |

| | | | | sys= a r | C-54 | | ***** | |
|-----------|--------|------------------|--------|---|---------------|--------|------------|------------------|
| | | าก | SUM | OF SOUNDERS | MEAN | SOUARE | 1 | PROB>F |
| REGRES | SION | 1 | 00 | OF SQUARES 0.11782452 | 0.11 | 782452 | 69.3 | 7 0.0004 |
| ERROR | 2-01- | 5 | | 0.11782452 0.00849241 | 0.00 | 169848 | | |
| TOTAL | | 6 | | 0.12631693 | | | | |
| | | - | | *************************************** | | | | |
| INTERC | | B VA -3.18672 | | STD ERROR | TYPE | II SS | I | PROB>F |
| | | | | 0.01473668 | 0.11 | 782452 | 69.37 | 0.0004 |
| | | | | NUMBER | | | | G(D) |
| | | RED RE | MOVED | | | | | C(P) |
| 1 | Z1 | | | 1 | 0.932 | 8 (| 0.9328 | 1.08414 |
| | | | | SYS=AS | N-63 | | | |
| NO VAR | IABLE | s met the | 0.1500 | SIGNIFICA | NCE LEVEL | FOR EN | TRY INTO | THE MODEL. |
| | | | | SYS= A S | N-70 | | | |
| No 1110 | | a . com . com | 0 1500 | | NOT THE | 200 D | IMPO TARMO | MILE MODEL |
| NO VAR | IABLE | S MET THE | 0.1500 | SIGNIFICA | MCE LEVEL | FOR EX | AIKI INIO | THE MODEL. |
| | | | | SYS= A S | N-99 - | | | |
| | | DF | SUM | of squares | MEAN | SQUARE | F | PROB>F 0.1419 |
| REGRES | SION | 1 | | 0.10319665 | 0.10 | 319665 | 2.86 | 0.1419 |
| ERROR | | 1 6 7 | | 0.21670613 | 0.03 | 611769 | | |
| TOTAL | | 7 | | 0.31990278 | | | | |
| TAMEO | E-COAT | B VA -3.71223 | | STD ERROR | TYPE | II SS | F | PROB>F |
| Z1 | EP-I | | | 0.07230398 | 0 10 | 319665 | 2 86 | 0.1419 |
| 41 | | 0.12221 | 135 | 0.07230396 | 0.10 | 213003 | 2.00 | 0.1413 |
| | | VARIABLE | | NUMBER | PARTIA | L | MODEL | |
| STEP | ENTE | | | IN | | | | C(P) |
| 1 | 21 | | | | | | | 1.03675 |
| | | | | | | | | |
| * | | | | sys=asn | -108 | | | |
| | | DF | SUM | OF SQUARES | MEAN | SQUARE | F | PROB>F |
| REGRES | STON | 1 | | 0.11931741 | | | | |
| ERROR | DION | 3 | | 0.02348470 | | 782823 | 20.2 | 0.0250 |
| TOTAL | | 4 | | 0.14280211 | | ,02020 | | |
| IOIAL | | 4 | | 0.14200211 | | | | |
| | | B VA | LUE | STD ERROR | TYPE | II SS | F | PROB>F |
| INTERCI | DPT | -1.91448 | | | | | _ | |
| Z1 | | -0.09411 | | 0.02410798 | 0.11 | 931741 | 15.24 | 0.0298 |
| | | VARIABLE | | NUMBER | PARTIA | г. | MODEL | |
| STEP | ENTE | | MOVED | IN | R** | | R**2 | C(P) |
| 1 | Z1 | انقاء تعييد. | | 1 | 0.835 | | .8355 | 0.14936 |
| - | | | | - | 3.030 | _ | | |

| | | sys=asq- | 133 | | |
|-------------|--------------------------|--------------|----------------|-------------|-----------|
| | DF SUM | OF SQUARES | MEAN SQUAR | E F | PROB>F |
| REGRESSION | 1 | 0.27102133 | 0.2710213 | 32.26 | 0.0047 |
| ERROR | 4 5 | 0.03360165 | 0.00840043 | <u>.</u> | |
| | | | | | |
| INTERCEPT | B VALUE -0.21450800 | STD ERROR | TYPE II SS | s F | PROB>F |
| Z1 | -0.15053337 | 0.02650217 | 0.27102133 | 32.26 | 0.0047 |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP ENTE | RED REMOVED | IN | R**2 | R**2 | C(P) |
| 1 21 | | 1 | 0.8897 | 0.8897 | 0.55358 |
| | | sys=asw | -32 | | |
| | DF SUM | OF SQUARES | MEAN SOUARE | F | PROB>F |
| REGRESSION | 1 | 0.21856871 | 0.21856871 | 5.03 | 0.0883 |
| ERROR | 4 | 0.17379957 | 0.04344989 |) | |
| TOTAL | DF SUM 1 4 5 | 0.39236828 | | | |
| INTERCEPT | B VALUE -1.32228292 | STD ERROR | TYPE II SS | ; F | PROB>F |
| z1 | -0.14043494 | 0.06261459 | 0.21856871 | 5.03 | 0.0883 |
| | VARIABLE RED REMOVED | NUMBER | PARTIAL | MODEL | |
| STEP ENTE | RED REMOVED | IN | R**2 | R**2 | C(P) |
| 1 Z1 | | 1 | 0.5570 | 0.5570 | 1.61839 |
| | ~ | sys=cp-1 | 035N | | |
| NO VARIABLE | S MET THE 0.1500 |) significan | CE LEVEL FOR E | NTRY INTO T | HE MODEL. |
| ~~~~~~~~~ | | SYS=JTT1 | DS | | |
| | | | | | |
| | | | MEAN SQUARE | F | |
| REGRESSION | 2 | 0.24230245 | 0.12115122 | | 0.0002 |
| ERROR | 2 | 0.00005085 | 0.00002542 | | |
| TOTAL | 4 | 0.24235329 | | | |
| INTERCEPT | B VALUE -0.33479724 | STD ERROR | TYPE II SS | F | PROB>F |
| Z1 | -0.19895651 | 0.00232942 | 0,18545801 | 7294.95 | 0.0001 |
| Z 2 | -0.00975694 | 0.00164089 | 0.00089886 | | 0.0271 |
| | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP ENTER | | IN | R**2 | R**2 | C(P) |
| 1 21 | المترا المتعادل المتعادل | 1 | | 0.9961 | 22.4416 |
| 2 22 | | 2 | | 0.9998 | 2.2550 |

| | | | VAR | IAE | LE | | | | |
|----------------|------------|---------------|------------------------|------|-----------------------|---------------|------|------------------|---------|
| | ST | ₽ 1 | ENTERED Z1 | | REMOVED | F 762.5651 | | PROB>F 0.0001 | |
| | | 2 | Z 2 | | | 35.3564 | | 0.0271 | |
| | | | | | sys=lan | nav | | | |
| | | | DF S | n IM | OF SQUARES | MEAN SOU | ARE | F | PROB>F |
| RECRES | STON | | 1 | .011 | 0.40052225 | | | 40204.49 | |
| ERROR | | | 5 | | 0.00004981 | 0.00000 | 996 | | |
| TOTAL | | | 6 | | 0.40057206 | | | | |
| | | | B VALUE | | STD ERROR | TYPE II | SS | F | PROB>F |
| | ept | | 64554446 | | | | 005 | 10001 10 | 0.0001 |
| Z1 | | -0. | 12220077 | | 0.00060945 | 0.40052 | 225 | 40204.49 | 0.0001 |
| | | VAR | IABLE | | | PARTIAL | | | Q(D) |
| STEP | | RED | REMOVE | D | IN | R**2 | | | C(P) |
| 1 | Z1 | | | | 1 | 0.9999 | U | .9999 | 2.87387 |
| | | | | | sys=lani | ARP | | | |
| | | | DF S | MUS | OF SQUARES | mean squ | ARE | F | PROB>F |
| REGRES | SION | | 2 | , | 0.32598953 | 0.16299 | 476 | 99999.99 | 0.0001 |
| ERROR | | | 4 | | 0.00000634 | 0.00000 | 158 | | |
| TOTAL | | | 6 | | 0.32599587 | | | | |
| | | | B VALUE | | STD ERROR | TYPE II | SS | F | PROB>F |
| | EPT | | 43865929 | | 0.00025772 | 0 28774 | 700 | 99999.99 | 0.0001 |
| Z1 | | | 10981132 00007521 | | 0.00025772 | 0.00019 | | 125.43 | 0.0004 |
| Z 3 | | 0. | 00007321 | | | | | | |
| | | | RIABLE | | NUMBER | | | MODEL | G(D) |
| STEP | | RED | REMOVI | ED | IN | R**2 | _ | R**2 .9994 | C(P) |
| 1 | Z1 | | | | 1 2 | 0.9994 | | .0000 | 2.226 |
| 2 | Z 3 | | 1731 | וגדכ | e Ble | 0.0006 | 1 | .0000 | 2.220 |
| | ST | rio Ora | ENTERED | | REMOVED | F | | PROB>F | |
| | | 1 | 21 | | | 7940.7559 | | 0.0001 | |
| | | 2 | Z 3 | | | 125.4327 | | 0.0004 | |
| | | | | | sys=lan | REC | | | |
| | | | | | | | מסגו | F | PROB>F |
| | | | | SUM | OF SQUARES 0.14785176 | | | | 0.0001 |
| REGRES | SION | | 1 3 | | 0.00058456 | | | ,50.75 | 0.0002 |
| ERROR TOTAL | | | 4 | | 0.14843632 | 0.00013 | | | |
| | | | B VALUE | | STD ERROR | TYPE II | ss | F | PROB>F |
| INTERC | ept | | .34649331 .14556527 | | 0.00528443 | 0.14785 | 5176 | 758.78 | 0.0001 |
| | | | | | | | | | |

| STEP 1 | ENTE Z1 | | IABLE REMOVE | | NUMBER IN 1 | PARTIAL R**2 0.9961 | | R**2 | C(P) 1.36336 |
|-----------|------------|------|-----------------|-----------|-----------------------|---------------------------|------|--------|-----------------|
| C.5.4 | - Hel: | lcop | ter Progr | ams | <u>3</u> | | | | |
| | | | | - | SYS=HH-! | 52 | | | |
| | | | | | | <i>)</i> | | | |
| | | | DF S | UM. | OF SQUARES | MEAN SQU | ARE | F | PROB>F |
| REGRES | STON | | 1 | ••• | 0.12412828 | | | 38.92 | 0.0034 |
| ERROR | DION | | | | 0.01275667 | 0.00318 | | | |
| TOTAL | | | 5 | | 0.13688495 | | | | |
| | | | | | | | | | |
| | | | B VALUE | | STD ERROR | TYPE II | SS | F | PROB>F |
| INTERC | EPT | 0. | 83324089 | | | | | | |
| Z1 | | -0. | 18605919 | | 0.02982321 | 0.12412 | 828 | 38.92 | 0.0034 |
| | | VAR | IABLE | | NUMBER | PARTIAL | | | |
| STEP | ENTE | RED | REMOVE | D | IN | R**2 | | R**2 | C(P) |
| 1 | Z 1 | | | | 1 | 0.9068 | 0. | 9068 | 2.22061 |
| | | | | | | | | | |
| | | | | | SYS=CH- | 46 | | | |
| | | | | | om | ACIDAL COLL | 3 DD | F | PPORSE |
| | | | | UM | OF SQUARES | MEAN SQU | ARE | 41.82 | 0.0008 |
| REGRES | SSION | | 2 | | 1.23047248 | | | 41.02 | 0.0008 |
| ERROR | | | 5 | | 0.07355530 | 0.01471 | TOP | | |
| TOTAL | | | 7 | | 1.30402778 | myrote tt | cc | F | PROB>F |
| | | _ | B VALUE | | STD ERROR | TYPE II | ಎಎ | F | FRODYE |
| | EF.T. | | 36868024 | | 0 02790654 | 0.95043 | 1 40 | 64.61 | 0.0005 |
| Z1 | | | 22350402 | | 0.02780654 0.01231329 | 0.33043 | | | 0.0417 |
| Z2 | | -0. | 03351173 | | 0.01231329 | 0.10030 | J/J | 7.74 | 0.011, |
| | | VAR | IABLE | | NUMBER | PARTIAL | M | ODEL | |
| STEP | ENTE | | REMOVE | | | R**2 | | R**2 | C(P) |
| 1 | Z1 | | | _ | 1 | 0.8600 | 0. | 8600 | 7.07423 |
| 2 | Z 2 | | | | 2 | 0.0836 | 0. | 9436 | 2.46287 |
| | | | | | | | | | |
| | | | VARI | | | | | | |
| | ST | EP | ENTERED | | REMOVED | F | | PROB>F | |
| | | 1 | Z1 | | | 36.8672 | | 0.0009 | |
| | | 2 | 22 | | | 7.4071 | | 0.0417 | |
| | | | | | SYS=H- | 53 | | | |
| | | | | | | | | | |
| | | | DF S | UM | OF SQUARES | | | F | PROB>F |
| REGRES | SSION | | 1 | | 0.36413891 | | | 56.37 | 0.0003 |
| ERROR | | | 6 | | 0.03876051 | 0.00646 | 800 | | |
| TOTAL | | | 7 | | 0.40289942 | | | | |

| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
|--|--|--|--|--|--|
| INTERCEPT Z1 | 2.07266030 -0.14183982 | 0.01889225 | 0.36413891 | 56.37 | 0.0003 |
| COURSE TO THE | VARIABLE | | PARTIAL R**2 | MODEL R**2 | C(P) |
| STEP ENTE | RED REMOVED | IN 1 | | | 0.07011 |
| 1 21 | | - | 0.5030 0 | . 7030 | 0.07011 |
| | | SYS=CH | 47 | ~~~~~~~ | |
| | DF SUM | OF SQUARES | MEAN SQUARE | F | PROB>F |
| REGRESSION | 2 | 0.69121174 | 0.34560587 | 8.65 | 0.0080 |
| ERROR | 9 | 0.35964297 | 0.03996033 | | |
| TOTAL | 11 | 1.05085471 | | | • |
| | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| INTERCEPT | 2.12140343 | | | | |
| Z1 | -0.13334229 | 0.04047426 | 0.43371767 | 10.85 | 0.0093 |
| Z 2 | -0.03107691 | 0.01625348 | 0.14608719 | 3.66 | 0.0882 |
| | | | | | |
| | VARIABLE | NUMBER | | MODEL | |
| | RED REMOVED | IN | | R**2 | C(P) |
| 1 21 | | 1 | 0.5187 0 | | |
| 2 Z 2 | | 2 | 0.1390 0 | .6578 | 2.04234 |
| | VARIA | | _ | | |
| | | | | | |
| ST | EP ENTERED | REMOVED | F | PROB>F | |
| ST | 1 Z1 | REMOVED | 10.7790 | 0.0082 | |
| ST | | REMOVED | | | |
| | 1 Z1 2 Z2 | | 10.7790 | 0.0082 0.0882 | |
| | 1 Z1 2 Z2 | SYS=H- | 10.7790 3.6558 54 | 0.0082 0.0882 | PP()R)F |
| | 1 Z1 2 Z2 DF SUM | SYS=H- | 10.7790 3.6558 54 | 0.0082 0.0882 | |
| RECRESSION | 1 Z1 2 Z2 | SYS=H-! OF SQUARES 0.18000333 | 10.7790 3.6558 54 MEAN SQUARE 0.18000333 | 0.0082 0.0882 | |
| RECRESSION ERROR | 1 Z1 2 Z2 | SYS=H-! OF SQUARES 0.18000333 0.05167528 | 10.7790 3.6558 54 | 0.0082 0.0882 | |
| RECRESSION | 1 Z1 2 Z2 | SYS=H-! OF SQUARES 0.18000333 | 10.7790 3.6558 54 MEAN SQUARE 0.18000333 | 0.0082 0.0882 | |
| RECRESSION ERROR | 1 Z1 2 Z2 | SYS=H-! OF SQUARES 0.18000333 0.05167528 | 10.7790 3.6558 54 MEAN SQUARE 0.18000333 | 0.0082 0.0882 | |
| REGRESSION ERROR TOTAL | 1 Z1 2 Z2 DF SUM 1 3 4 B VALUE | OF SQUARES 0.18000333 0.05167528 0.23167861 | 10.7790 3.6558 54 MEAN SQUARE 0.18000333 0.01722509 | 0.0082 0.0882 F 10.45 | 0.0481 |
| RECRESSION ERROR TOTAL | 1 Z1 2 Z2 | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR | 10.7790 3.6558 54 | 0.0082 0.0882 F 10.45 | 0.0481 PROB>F |
| REGRESSION ERROR TOTAL | 1 Z1 2 Z2 DF SUM 1 3 4 B VALUE 1.76204133 -0.15447484 | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 | 10.7790 3.6558 54 | 0.0082 0.0882 | 0.0481 PROB>F |
| RECRESSION ERROR TOTAL INTERCEPT Z1 | 1 Z1 2 Z2 DF SUM 1 3 4 B VALUE 1.76204133 -0.15447484 VARIABLE | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 NUMBER IN | 10.7790 3.6558 54 | 0.0082 0.0882 F 10.45 F 10.45 | 0.0481 PROB>F 0.0481 C(P) |
| RECRESSION ERROR TOTAL INTERCEPT Z1 | 1 Z1 2 Z2 DF SUM 1 3 4 B VALUE 1.76204133 -0.15447484 | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 NUMBER IN | 10.7790 3.6558 54 | 0.0082 0.0882 F 10.45 F 10.45 | 0.0481 PROB>F 0.0481 C(P) |
| RECRESSION ERROR TOTAL INTERCEPT Z1 STEP ENTE | 1 Z1 2 Z2 DF SUM 1 3 4 B VALUE 1.76204133 -0.15447484 VARIABLE RED REMOVED | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 NUMBER IN 1 | 10.7790 3.6558 54 | 0.0082 0.0882 F 10.45 F 10.45 MODEL R**2 | 0.0481 PROB>F 0.0481 C(P) 1.11535 |
| RECRESSION ERROR TOTAL INTERCEPT Z1 STEP ENTE | 1 Z1 2 Z2 DF SUM 1 3 4 B VALUE 1.76204133 -0.15447484 VARIABLE RED REMOVED | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 NUMBER IN 1 | 10.7790 3.6558 54 | 0.0082 0.0882 F 10.45 F 10.45 MODEL R**2 | 0.0481 PROB>F 0.0481 C(P) 1.11535 |
| RECRESSION ERROR TOTAL INTERCEPT Z1 STEP ENTE | DF SUM 1 3 4 B VALUE 1.76204133 -0.15447484 VARIABLE RED REMOVED | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 NUMBER IN 1 | 10.7790 3.6558 54 | 0.0082 0.0882 F 10.45 F 10.45 MODEL R**2 | 0.0481 PROB>F 0.0481 C(P) 1.11535 |
| RECRESSION ERROR TOTAL INTERCEPT Z1 STEP ENTE 1 Z1 | 1 Z1 2 Z2 DF SUM 1 3 4 B VALUE 1.76204133 -0.15447484 VARIABLE RED REMOVED | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 NUMBER IN 1SYS=HH-COF SQUARES | 10.7790 3.6558 54 | 0.0082 0.0882 F 10.45 F 10.45 MODEL R**2 .7770 | 0.0481 PROB>F 0.0481 C(P) 1.11535 PROB>F |
| RECRESSION ERROR TOTAL INTERCEPT Z1 STEP ENTE | 1 Z1 2 Z2 DF SUM 1 3 4 B VALUE 1.76204133 -0.15447484 VARIABLE RED REMOVED | OF SQUARES 0.18000333 0.05167528 0.23167861 STD ERROR 0.04778574 NUMBER IN 1SYS=HH-OF SQUARES 0.06912153 | 10.7790 3.6558 54 | 0.0082 0.0882 F 10.45 F 10.45 MODEL R**2 .7770 | 0.0481 PROB>F 0.0481 C(P) 1.11535 PROB>F |

| T NATURAL C | ሞርነው የው | B VALUE 2.23770674 | STD ERROR | TYPE II SS | F | PROB>F |
|---|-------------------|---|---|--|--|---|
| Z1 | ACAP I | | 0.01193889 | 0.06912153 | 52.99 | 0.0184 |
| | | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP | ENTE | RED REMOVED | IN | R**2 | R**2 | C(P) |
| | Z1 | | 1 | R**2 0.9636 | 0.9636 | • |
| | | | SYS=SH | -3 | | |
| | | | | | _ | |
| | | DF SU | M OF SQUARES | MEAN SQUARE | F | PROB>F |
| REGRES | SION | 1 | 0.32143167 | MEAN SQUARE 0.32143167 0.01306792 | 24.60 | 0.0016 |
| ERROR | | 7 | 0.09147543 | 0.01306792 | | |
| TOTAL | | 1 7 8 | 0.41290709 | | | |
| | | B VALUE | STD ERROR | TYPE II SS | F | PROB>F |
| INTERC | ጥዊዊ | 1.49416647 | | | _ | |
| Z1 | | -0.15806200 | 0.03187031 | 0.32143167 | 24.60 | 0.0016 |
| | | VARIABLE | NUMBER | PARTIAL | MODEL. | |
| STEP | TUNE | RED REMOVED | TN | R**2 | P**2 | C(P) |
| 1 | | | 1 | 0.7785 | 7785 | 1 19459 |
| • | 41 | | • | 0.7705 | 5.7705 | 1.17433 |
| C.5.5 | - Т ас | tical Armament | Programs | | | |
| <u> </u> | | | | | | |
| | | | | | | |
| | | | SYS=LLL | GB | | |
| | | | | | | |
| RECRES | STON | DF SU | 1 OF SQUARES | MEAN SQUARE | F | PROB>F |
| REGRES: | sion | DF SU | 1 OF SQUARES | MEAN SQUARE | F | PROB>F |
| RECRES: | sion | DF SU | 1 OF SQUARES | MEAN SQUARE | F | PROB>F |
| RECRES. ERROR TOTAL | SION | DF SU | 1 OF SQUARES | MEAN SQUARE | F | PROB>F |
| RECRES. ERROR TOTAL | SION | DF SUN 1 8 9 | 1 OF SQUARES 0.71772163 0.00152979 0.71925142 | MEAN SQUARE 0.71772163 0.00019122 | F 3753.30 | PROB>F 0.0001 |
| ERROR TOTAL | | DF SUN 1 8 9 B VALUE | 1 OF SQUARES 0.71772163 0.00152979 0.71925142 | MEAN SQUARE | F 3753.30 | PROB>F 0.0001 |
| ERROR TOTAL INTERC | ept | DF SUN 1 8 9 | 1 OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS | F 3753.30 | PROB>F 0.0001 PROB>F |
| ERROR TOTAL INTERC | ept | DF SUN 1 8 9 B VALUE -2.51061063 -0.17034813 | OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR 0.00278055 | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS | F 3753.30 | PROB>F 0.0001 PROB>F |
| ERROR TOTAL INTERC | ept | DF SUR 1 8 9 B VALUE -2.51061063 -0.17034813 VARIABLE | 1 OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS 0.71772163 PARTIAL | F 3753.30 F 3753.30 MODEL | PROB>F 0.0001 PROB>F |
| ERROR TOTAL INTERC | ept | DF SUR 1 8 9 B VALUE -2.51061063 -0.17034813 VARIABLE | OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR 0.00278055 | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS 0.71772163 PARTIAL | F 3753.30 F 3753.30 | PROB>F 0.0001 PROB>F |
| ERROR TOTAL INTERC Z1 | ept | DF SUR 1 8 9 B VALUE -2.51061063 -0.17034813 VARIABLE | OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR 0.00278055 NUMBER | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS 0.71772163 PARTIAL R**2 | F 3753.30 F 3753.30 MODEL | PROB>F 0.0001 PROB>F 0.0001 |
| ERROR TOTAL INTERC Z1 STEP | ept ente z1 | DF SUM 1 8 9 B VALUE -2.51061063 -0.17034813 VARIABLE RED REMOVED | OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR 0.00278055 NUMBER IN 1 | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS 0.71772163 PARTIAL R**2 0.9979 | F 3753.30 F 3753.30 MODEL R**2 | PROB>F 0.0001 PROB>F 0.0001 |
| ERROR TOTAL INTERC Z1 STEP | ept ente z1 | DF SUR 1 8 9 B VALUE -2.51061063 -0.17034813 VARIABLE | OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR 0.00278055 NUMBER IN 1 | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS 0.71772163 PARTIAL R**2 0.9979 | F 3753.30 F 3753.30 MODEL R**2 | PROB>F 0.0001 PROB>F 0.0001 |
| ERROR TOTAL INTERC Z1 STEP | ept ente z1 | DF SUN 1 8 9 B VALUE -2.51061063 -0.17034813 VARIABLE RED REMOVED | OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR 0.00278055 NUMBER IN 1 | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS 0.71772163 PARTIAL R**2 0.9979 | F 3753.30 F 3753.30 MODEL R**2 0.9979 | PROB>F 0.0001 PROB>F 0.0001 |
| ERROR TOTAL INTERC Z1 STEP | EPT ENTE Z1 | DF SUN 1 8 9 B VALUE -2.51061063 -0.17034813 VARIABLE RED REMOVED | OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR 0.00278055 NUMBER IN 1 | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS 0.71772163 PARTIAL R**2 0.9979 0 | F 3753.30 F 3753.30 MODEL R**2 9.9979 | PROB>F 0.0001 PROB>F 0.0001 C(P) 0.61282 |
| ERROR TOTAL INTERCI Z1 STEP 1 | EPT ENTE Z1 | DF SUN 1 8 9 B VALUE -2.51061063 -0.17034813 VARIABLE RED REMOVED | 1 OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR 0.00278055 NUMBER IN 1 | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS 0.71772163 PARTIAL R**2 0.9979 0 MEAN SQUARE 1.19255416 | F 3753.30 F 3753.30 MODEL R**2 9.9979 | PROB>F 0.0001 PROB>F 0.0001 C(P) 0.61282 PROB>F |
| ERROR TOTAL INTERCI Z1 STEP 1 | EPT ENTE Z1 | DF SUN 1 8 9 B VALUE -2.51061063 -0.17034813 VARIABLE RED REMOVED | 1 OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR 0.00278055 NUMBER IN 1 | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS 0.71772163 PARTIAL R**2 0.9979 0 MEAN SQUARE | F 3753.30 F 3753.30 MODEL R**2 9.9979 | PROB>F 0.0001 PROB>F 0.0001 C(P) 0.61282 PROB>F |
| ERROR TOTAL INTERCA Z1 STEP 1 REGRESS ERROR | EPT ENTE Z1 | DF SUN 1 8 9 B VALUE -2.51061063 -0.17034813 VARIABLE RED REMOVED DF SUN 2 5 | 1 OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR 0.00278055 NUMBER IN 1 SYS=CEN 1 OF SQUARES 2.38510832 0.01122093 | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS 0.71772163 PARTIAL R**2 0.9979 0 MEAN SQUARE 1.19255416 | F 3753.30 F 3753.30 MODEL R**2 9.9979 | PROB>F 0.0001 PROB>F 0.0001 C(P) 0.61282 PROB>F |
| ERROR TOTAL INTERCA Z1 STEP 1 REGRESS ERROR | EPT ENTE Z1 | DF SUN 1 8 9 9 E VALUE -2.51061063 -0.17034813 VARIABLE RED REMOVED DF SUN 2 5 7 E VALUE | 1 OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR 0.00278055 NUMBER IN 1 SYS=CEN 1 OF SQUARES 2.38510832 0.01122093 | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS 0.71772163 PARTIAL R**2 0.9979 0 MEAN SQUARE 1.19255416 | F 3753.30 F 3753.30 MODEL R**2 9.9979 | PROB>F 0.0001 PROB>F 0.0001 C(P) 0.61282 PROB>F |
| ERROR TOTAL INTERCE Z1 STEP 1 REGRESS ERROR TOTAL INTERCE | ENTE Z1 | DF SUN 1 8 9 9 B VALUE -2.51061063 -0.17034813 VARIABLE RED REMOVED DF SUN 2 5 7 B VALUE -1.76338250 | 1 OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR 0.00278055 NUMBER IN 1 SYS=CEN 1 OF SQUARES 2.38510832 0.01122093 2.39632925 | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS 0.71772163 PARTIAL R**2 0.9979 0 1 MEAN SQUARE 1.19255416 0.00224419 | F 3753.30 F 3753.30 MODEL R**2 9.9979 | PROB>F 0.0001 PROB>F 0.0001 C(P) 0.61282 PROB>F 0.0001 |
| ERROR TOTAL INTERCA Z1 STEP 1 REGRESS ERROR TOTAL | ENTE Z1 | DF SUN 1 8 9 9 E VALUE -2.51061063 -0.17034813 VARIABLE RED REMOVED DF SUN 2 5 7 E VALUE | 1 OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR 0.00278055 NUMBER IN 1 SYS=CEN 1 OF SQUARES 2.38510832 0.01122093 2.39632925 | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS 0.71772163 PARTIAL R**2 0.9979 0 1 MEAN SQUARE 1.19255416 0.00224419 | F 3753.30 F 3753.30 MODEL R**2 9.9979 F 531.40 | PROB>F 0.0001 PROB>F 0.0001 C(P) 0.61282 PROB>F 0.0001 |
| ERROR TOTAL INTERCE Z1 STEP 1 REGRESS ERROR TOTAL INTERCE | ENTE Z1 | DF SUN 1 8 9 9 B VALUE -2.51061063 -0.17034813 VARIABLE RED REMOVED DF SUN 2 5 7 B VALUE -1.76338250 | OF SQUARES 0.71772163 0.00152979 0.71925142 STD ERROR 0.00278055 NUMBER IN 1SYS=CEN 1 OF SQUARES 2.38510832 0.01122093 2.39632925 STD ERROR | MEAN SQUARE 0.71772163 0.00019122 TYPE II SS 0.71772163 PARTIAL R**2 0.9979 0 MEAN SQUARE 1.19255416 0.00224419 TYPE II SS | F 3753.30 F 3753.30 MODEL R**2 9.9979 F 531.40 | PROB>F 0.0001 PROB>F 0.0001 C(P) 0.61282 |

| STEP 1 2 | ENTE Z1 Z2 | VARIA RED | BLE REMOVED | NUMBER IN 1 2 | PARTIAL R**2 0.9671 0.0282 | MODEL R**2 0.9671 0.9953 | C(P) 28.6780 2.6575 | | | | |
|--|------------------|---|---------------------------------------|---|--|--|---|--|--|--|--|
| ************************************** | | | | | | | | | | | |
| | | | VARIA | | 75 | DDOD E | | | | | |
| | ST | | NTERED | REMOVED | F | PROB>F | | | | | |
| | | 1 Z | | | 176.6261 | 0.0001 | | | | | |
| | | 2 Z | 2 | | 30.0813 | 0.0027 | | | | | |
| SYS=GBU-15 | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | DF | | | MEAN SQUAR | | | | | | |
| REGRES | SION | 1 | | | 0.0939983 | | 0.0259 | | | | |
| ERROR | | 7 | | | 0.0118458 | 8 | | | | | |
| TOTAL | | 8 | | 0.17691956 | | | | | | | |
| | | | | | | | | | | | |
| | | В | VALUE | STD ERROR | TYPE II S | S F | PROB>F | | | | |
| INTERC | EPT | -1.47 | 118132 | | | | | | | | |
| Z1 | | -0.05 | 988187 | 0.02125783 | 0.0939983 | 9 7.94 | 0.0259 | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | VARIA | BLE | NUMBER | PARTIAL | MODEL | | | | | |
| STEP | ENTE | RED | REMOVED | IN | R**2 | R**2 | C(P) | | | | |
| 1 | Z1 | | | 1 | 0.5313 | 0.5313 | 3.52993 | | | | |
| _ | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| C.5.6 | - Tac | tical: | Missile Pr | cograms | | | | | | | |
| <u>c.5.6</u> | - Tac | tical | Missile Pı | cograms | | | - | | | | |
| <u>c.5.6</u> | - Tac | tical | | | AAM | | | | | | |
| <u>C.5.6</u> | - Tac | tical | | | AAM | | | | | | |
| <u>C.5.6</u> | - Tac | * | | SYS=AMR | | | | | | | |
| | | DF | SUM | sys=amr of squares | MEAN SQUAR | E F | PROB>F | | | | |
| RECRES | | DF 1 | SUM | SYS=AMR OF SQUARES 3.86655114 | MEAN SQUAR 3.8665511 | E F 4 7317.93 | | | | | |
| REGRES ERROR | | DF 1 8 | SUM | SYS=AMR OF SQUARES 3.86655114 0.00422694 | MEAN SQUAR | E F 4 7317.93 | PROB>F | | | | |
| RECRES | | DF 1 | SUM | SYS=AMR OF SQUARES 3.86655114 | MEAN SQUAR 3.8665511 | E F 4 7317.93 | PROB>F | | | | |
| REGRES ERROR | | DF 1 8 9 | SUM | OF SQUARES 3.86655114 0.00422694 3.87077808 | MEAN SQUAR 3.8665511 0.0005283 | E F 4 7317.93 7 | PROB>F 0.0001 | | | | |
| RECRES ERROR TOTAL | SION | DF 1 8 9 | SUM | SYS=AMR OF SQUARES 3.86655114 0.00422694 | MEAN SQUAR 3.8665511 | E F 4 7317.93 7 | PROB>F | | | | |
| RECRES ERROR TOTAL | SION | DF 1 8 9 B 1.68 | SUM VALUE 243228 | OF SQUARES 3.86655114 0.00422694 3.87077808 STD ERROR | MEAN SQUAR 3.8665511 0.0005283 | E F 4 7317.93 7 | PROB>F 0.0001 PROB>F | | | | |
| RECRES ERROR TOTAL | SION | DF 1 8 9 B 1.68 | SUM VALUE 243228 | OF SQUARES 3.86655114 0.00422694 3.87077808 STD ERROR | MEAN SQUAR 3.8665511 0.0005283 | E F 4 7317.93 7 | PROB>F 0.0001 PROB>F | | | | |
| RECRES ERROR TOTAL | SION | DF 1 8 9 B 1.68 | SUM VALUE 243228 | OF SQUARES 3.86655114 0.00422694 3.87077808 STD ERROR | MEAN SQUAR 3.8665511 0.0005283 | E F 4 7317.93 7 | PROB>F 0.0001 PROB>F | | | | |
| RECRES ERROR TOTAL | SION | DF 1 8 9 B 1.68 -0.35 | SUM VALUE 243228 610306 | OF SQUARES 3.86655114 0.00422694 3.87077808 STD ERROR 0.00416276 | MEAN SQUAR 3.8665511 0.0005283 TYPE II S | F 7317.93 7 F 7317.93 | PROB>F 0.0001 PROB>F | | | | |
| RECRES ERROR TOTAL INTERC Z1 | SION | DF 1 8 9 B 1.68 -0.35 | SUM VALUE 243228 610306 BLE | OF SQUARES 3.86655114 0.00422694 3.87077808 STD ERROR 0.00416276 NUMBER | MEAN SQUAR 3.8665511 0.0005283 TYPE II S 3.8665511 | F 4 7317.93 S F 4 7317.93 | PROB>F 0.0001 PROB>F 0.0001 | | | | |
| RECRES ERROR TOTAL INTERC Z1 | SION | DF 1 8 9 B 1.68 -0.35 | SUM VALUE 243228 610306 | OF SQUARES 3.86655114 0.00422694 3.87077808 STD ERROR 0.00416276 NUMBER IN | MEAN SQUAR 3.8665511 0.0005283 TYPE II S 3.8665511 PARTIAL R**2 | E F 4 7317.93 7 S F 4 7317.93 MODEL R**2 | PROB>F 0.0001 PROB>F 0.0001 | | | | |
| RECRES ERROR TOTAL INTERC Z1 | SION | DF 1 8 9 B 1.68 -0.35 | SUM VALUE 243228 610306 BLE | OF SQUARES 3.86655114 0.00422694 3.87077808 STD ERROR 0.00416276 NUMBER IN | MEAN SQUAR 3.8665511 0.0005283 TYPE II S 3.8665511 | E F 4 7317.93 7 S F 4 7317.93 MODEL R**2 | PROB>F 0.0001 PROB>F 0.0001 | | | | |
| RECRES ERROR TOTAL INTERCONTAL STEP | EPT ENTE Z1 | DF 1 8 9 B 1.68 -0.35 | SUM VALUE 243228 610306 BLE REMOVED | OF SQUARES 3.86655114 0.00422694 3.87077808 STD ERROR 0.00416276 NUMBER IN 1 | MEAN SQUAR 3.8665511 0.0005283 TYPE II S 3.8665511 PARTIAL R**2 0.9989 | F 4 7317.93 F 4 7317.93 MODEL R**2 0.9989 | PROB>F 0.0001 PROB>F 0.0001 C(P) 0.84349 | | | | |
| RECRES ERROR TOTAL INTERCONTAL STEP | EPT ENTE Z1 | DF 1 8 9 B 1.68 -0.35 | SUM VALUE 243228 610306 BLE REMOVED | OF SQUARES 3.86655114 0.00422694 3.87077808 STD ERROR 0.00416276 NUMBER IN 1 | MEAN SQUAR 3.8665511 0.0005283 TYPE II S 3.8665511 PARTIAL R**2 | F 4 7317.93 F 4 7317.93 MODEL R**2 0.9989 | PROB>F 0.0001 PROB>F 0.0001 C(P) 0.84349 | | | | |
| RECRES ERROR TOTAL INTERCONTAL STEP | EPT ENTE Z1 | DF 1 8 9 1.68 -0.35 VARIA | SUM VALUE 243228 610306 BLE REMOVED | OF SQUARES 3.86655114 0.00422694 3.87077808 STD ERROR 0.00416276 NUMBER IN 1 | MEAN SQUARS 3.8665511 0.0005283 TYPE II SS 3.8665511 PARTIAL R**2 0.9989 | E F 4 7317.93 7 S F 4 7317.93 MODEL R**2 0.9989 | PROB>F 0.0001 PROB>F 0.0001 C(P) 0.84349 | | | | |
| RECRES ERROR TOTAL INTERCONTAL STEP | EPT ENTE Z1 | DF 1 8 9 B 1.68 -0.35 VARIA RED | SUM VALUE 243228 610306 BLE REMOVED | OF SQUARES 3.86655114 0.00422694 3.87077808 STD ERROR 0.00416276 NUMBER IN 1 | MEAN SQUARS 3.8665511 0.0005283 TYPE II SS 3.8665511 PARTIAL R**2 0.9989 | E F 4 7317.93 7 S F 4 7317.93 MODEL R**2 0.9989 | PROB>F 0.0001 PROB>F 0.0001 C(P) 0.84349 | | | | |
| RECRES ERROR TOTAL INTERCONTAL STEP | ENTE Z1 | DF 1 8 9 B 1.68 -0.35 VARIA RED | SUM VALUE 243228 610306 BLE REMOVED | OF SQUARES 3.86655114 0.00422694 3.87077808 STD ERROR 0.00416276 NUMBER IN 1SYS=HA OF SQUARES 2.42228052 | MEAN SQUARS 3.8665511 0.0005283 TYPE II SS 3.8665511 PARTIAL R**2 0.9989 RM MEAN SQUARS 0.8074268 | E F 4 7317.93 7 S F 4 7317.93 MODEL R**2 0.9989 | PROB>F 0.0001 PROB>F 0.0001 C(P) 0.84349 | | | | |
| RECRES ERROR TOTAL INTERC Z1 STEP 1 | EPT ENTE Z1 SION | DF 1 8 9 B 1.68 -0.35 VARIA RED | SUM VALUE 243228 610306 BLE REMOVED | OF SQUARES 3.86655114 0.00422694 3.87077808 STD ERROR 0.00416276 NUMBER IN 1SYS=HA OF SQUARES 2.42228052 | MEAN SQUARS 3.8665511 0.0005283 TYPE II SS 3.8665511 PARTIAL R**2 0.9989 | E F 4 7317.93 7 S F 4 7317.93 MODEL R**2 0.9989 | PROB>F 0.0001 PROB>F 0.0001 C(P) 0.84349 | | | | |

| | | B VALUE | STD ERROR | TYPE II | ss f | PROB>F |
|-----------------------|------------|------------|--------------|------------|----------|--------------|
| | | .62374635 | | | | |
| | Z1 -0.2232 | | 0.00822781 | | | 0.0001 |
| 22 | | 0.03103104 | 0.00869326 | | | 0.0091 |
| Z 3 | (| 0.00746506 | 0.00267922 | 0.011813 | 38 7.76 | 0.0271 |
| | 177 | DIADI D | M MODEO | Dipart | MODER | |
| CHEST | | RIABLE | NUMBER | PARTIAL | MODEL | 7/7 \ |
| STEP | ENTERE |) REMOVED | _ | R**2 | R**2 | C(P) |
| 1 | Z1 | | 1 | 0.9848 | 0.9848 | 17.2441 |
| 2 3 | Z2 Z3 | | 2 3 | 0.0059 | 0.9908 | 9.7633 |
| 3 | 23 | | 3 | 0.0049 | 0.9956 | 4.0000 |
| | | VARI. | ABLE | | | |
| | STEP | ENTERED | REMOVED | F | PROB>F | |
| | 1 | Z1 | | 584.5267 | 0.0001 | |
| | 2 | Z2 | | 5.1375 | 0.0532 | |
| | 3 | Z 3 | | 7.7633 | 0.0271 | |
| | | | SYS=I | rb | | |
| | | | 515-[] | IK | | |
| | | DF SUI | M OF SQUARES | MEAN SQUAF | æ F | PROB>F |
| REGRESSION 3 | | 2.67373327 | | | 0.0001 | |
| ERROR | | 5 | 0.02754854 | 0.0055097 | | |
| TOTAL | | 8 | 2.70128181 | | _ | |
| | | B VALUE | STD ERROR | TYPE II S | SS F | PROB>F |
| INTERCEPT -0.04615566 | | | | | | |
| Z1 | -0 | .24109761 | 0.01474557 | 1.4729620 | 6 267.34 | 0.0001 |
| Z2 | -0 | .03307276 | 0.01047234 | 0.0549517 | | 0.0251 |
| Z 3 | 0 | .00422128 | 0.00216844 | 0.0208796 | 3.79 | 0.1091 |
| | VA | RIABLE | NUMBER | PARTIAL | MODEL | |
| STEP | ENTERED | REMOVED | IN | R**2 | R**2 | C(P) |
| 1 | Z1 | | 1 | 0.9474 | | 20.8096 |
| 2 | Z2 | | 2 3 | 0.0347 | 0.9821 | 5.7896 |
| 3 | Z 3 | | 3 | 0.0077 | 0.9898 | 4.0000 |
| | | VARIA | AH.E | | | |
| | STEP | ENTERED | REMOVED | F | PROB>F | |
| | 1 | Z1 | | 125.9713 | 0.0001 | • |
| | 2 | Z2 | | 11.6183 | 0.0143 | |
| | 3 | Z 3 | | 3.7896 | 0.1091 | |
| | _ | | | | | |
| | | | SYS=AIM7 | F-R | | |
| | | DF SUM | OF SQUARES | MEAN SQUAR | E F | PROB>F |
| RECRESSION | | 2 | 3.45535635 | 1.7276781 | | 0.0001 |
| ERROR | | 5 | 0.01955148 | 0.0039103 | | – |
| TOTAL | | 7 | 3.47490783 | | | |

| INTERC | יייטיםי | B VALUE 1.15179091 | STD ERROR | TYPE II S | s f | PROB>F |
|-------------|------------|-----------------------|------------|-------------|----------|---------|
| 21 | | -0.39169935 | 0.01371427 | 3.1898457 | 1 815.76 | 0.0001 |
| Z2 Z2 | | -0.01126437 | 0.00583969 | 0.0145493 | | 0.1116 |
| 64 | | -0.01126437 | 0.00565565 | 0.0145453 | 1 3.12 | 0.1110 |
| | , | VARIABLE | NUMBER | PARTIAL | MODEL | |
| STEP | ENTER | ed removed | IN | R**2 | R**2 | C(P) |
| 1 | Z1 | | 1 | 0.9902 | 0.9902 | 2.97887 |
| 2 | Z 2 | | 4 | 0.0042 | 0.9944 | 2.00129 |
| | | VARIA | | | | |
| | STE | PENTERED | REMOVED | F | PROB>F | |
| | | 1 Z1 | | 605.4055 | 0.0001 | |
| | | 2 Z 2 | | 3.7208 | 0.1116 | |
| | | | SYS=AIM7 | F~GD-~ | | |
| | | | | | | |
| | | DF SUM | OF SQUARES | MEAN SQUARI | e f | PROB>F |
| REGRES | SION | 1 | 4.95424289 | 4.95424289 | 9 237.69 | 0.0001 |
| ERROR | | 4 | 0.08337301 | 0.02084329 | 5 | |
| TOTAL | | 4 5 | 5.03761591 | | | |
| 7. WT 20.00 | man m | B VALUE | STD ERROR | TYPE II S | s f | PROB>F |
| INTERC | | 1.04508899 | | | | |
| Z1 | • | -0.46191702 | 0.02996112 | 4.95424289 | 9 237.69 | 0.0001 |
| | , | VARIABLE | NUMBER | PARTIAL | MODEL | |
| | • | | ** | | | |
| STEP | ENTER | | IN | R**2 | R**2 | C(P) |

C.6 - Modified Alternative One Non-linear Regression

This section contains the summary results produced by the non-linear regression procedure in SAS. The SAS program used to produce this run was discussed in Appendix B.6.

C.6.1 - Bomber Aircraft Programs

| | | |
|--------------------------|--------------------|------------------------|
| | SYS=B-1B | |
| NON-LINEAR LEAST SQUARES | SUMMARY STATISTICS | DEPENDENT VARIABLE TCA |
| SOURCE | DF SUM OF SQUARES | MEAN SQUARE |
| REGRESSION | 5 59477976.810 | 11895595.362 |
| RESIDUAL | 0.000 | 0.000 |
| UNCORRECTED TOTAL | 5 59477976.810 | |
| (CORRECTED TOTAL) | 4 17234615.032 | |

| PAR | AMETE | R | ESTIN | ATE | | TOTIC ERROR | | CONFIDE | NOTIC 95 % NCE INTERVAL UPPER |
|-----------------------|--|---|--|--|---|--|---|--|---|
| A B C D E | | - | 71.1154 -0.1207 -1.2592 0.0172 -0.0016 | 7258 2530 2283 | | 0 0 0 0 | 471.11 -0.12 -1.25 0.01 -0.00 | LOWER 546791 072576 925304 722827 167231 | 00000000000000000000000000000000000000 |
| LOT | ХГ | χU | YI | R | AUC | UCEP | | DIF | PCT |
| 1 2 3 4 5 | 0 1 8 18 52 | 1 8 18 52 100 | 7 7 10 1 34 3 | L.00000 7.00000 L.42857 3.40000 L.41176 | 260. 200. 142. 111. | 3 260 5 200 0 142 3 111 | 2.5 2.0 3.5 3.8 | 3163E-14 5271E-15 | 0 2.72971E-15 1.06316E-14 2.50191E-15 7.98004E-15 |
| | | | | | SYS | ≈B-52 | | | |
| NON-LI | NEAR : | LEAST | SQUAF | RES SUM | mary s | TATIST | ICS | DEPENDE | NT VARIABLE TCA |
| RES: | RESSI IDUAL | | OTAL | 5 | 7018 221 | 7964.3 2807.5 | 135 1 175 | MEAN SQUA 4037592.8 442561. | 367 |
| (00) | RRECT | ED TO | TAL) | 9 | 1807 | 0289.9 | 89 | | |
| PAR | amete | R | ESTIN | 1ATE | | TOTIC ERROR | | | NOTIC 95 % NCE INTERVAL UPPER |
| A B C D E | | - - | 55.4216 -0.1979 -1.0896 -0.0093 | 9825 5503 3222 | 0.132 0.302 | 52609 49679 58501 | -0.53 -1.86 -0.32 | 093838 4 864674 723175 700295 | 426.05414705 0.14268169 -0.31206879 0.30835858 0.08097256 |
| | 1 2 2 3 6 4 8 5 16 6 29 7 50 8 60 9 64 9 | 0 2 0 6 3 8 8 16 5 29 8 50 0 60 1 64 0 70 | 18 133 10 202 11 101 10 39 12 62 | 1.00 3 2.15 5 0.58 7 3.08 3 1.72 2 1.51 0.50 0 0.38 2 1.58 | 000 1 000 140 000 727 880 000 614 974 | UC 12.5 37.0 28.6 32.3 23.4 28.4 27.3 27.3 35.4 35.0 | UCP 78.5601 46.0826 48.4378 29.7992 29.6541 25.9869 28.6932 30.8457 26.5789 29.4688 | DIF 33.940 -9.083 -19.838 2.503 -6.254 2.413 -1.393 -3.546 8.823 5.533 | 3 -24.548 3 -69.363 7.742 4 -26.727 8 .497 3 -5.103 -12.988 24.918 |

| | | SYS=B-58 | |
|--|-------------------|--|-------------------------------------|
| NON-LINEAR LEAST SQUARES | su | MMARY STATISTICS | DEPENDENT VARIABLE TCA |
| SOURCE RECRESSION RESIDUAL UNCORRECTED TOTAL (CORRECTED TOTAL) | DF 4 0 4 | SUM OF SQUARES 14238328.874 0.000 14238328.874 1830393.074 | MEAN SQUARE 3559582.219 0.000 |
| PARAMETER ESTIMAT | Έ | ASYMPTOTIC STD. ERROR | ASYMPTOTIC 95 % CONFIDENCE INTERVAL |

| | | | | | | | LOWER | UPPER |
|--------|----|-----|------|----------|-------|-------|--------------|--------------|
| A | | | 16.6 | 6546663 | | 0 | 16.665466631 | 16.665466631 |
| В | | | -0.3 | 7971504 | | 0 | -0.379715043 | -0.379715043 |
| С | | | 0.4 | 1794575 | | 0 | 0.417945749 | 0.417945749 |
| D | | | -0.8 | 7300949 | | 0 | -0.873009490 | -0.873009490 |
| E | | | 0.2 | 7629059 | | 0 | 0.276290593 | 0.276290593 |
| 7 (20) | VT | wii | W.T | D | 2110 | *** | 222 | 7.000 |
| LOT | ХĽ | XU | ΥI | R | AUC | UCEP | DIF | PCT |
| 1 | 0 | 17 | 17 | 1.00000 | 93.86 | 93.86 | 1.77636E-15 | 1.89256E-15 |
| 2 | 17 | 53 | 36 | 2.11765 | 80.26 | 80.26 | 1.77636E-15 | 2.21325E-15 |
| 3 | 53 | 73 | 20 | 0.55556 | 73.16 | 73.16 | 1.77636E-15 | 2.42804E-15 |
| 4 | 73 | 103 | 30 | 1.50000 | 36.56 | 36.56 | 8.88178E-16 | 2.42937E-15 |

C.6.2 - Fighter Aircraft Programs

| SYS=A-10 | |
|--------------|--|
| | |

| NON-LINEAR LE | AST SQUARES | SUM | MARY : | STATIS | TIC | S DEPENI | DENT | VARIABLE | TCA |
|---------------|-------------|-----|--------|--------|-----|-------------|-------|-----------|-----|
| SOURCE | 1 | DF | SUM O | F SQUA | RES | MEAN S | QUARE | E | |
| REGRESSION | | 5 | 5178 | 8580.2 | 874 | 1035716 | .0575 | 5 | |
| RESIDUAL | | 4 | (| 8637.0 | 970 | 2159 | .2743 | 3 | |
| UNCORRECTE | D TOTAL | 9 | 518 | 7217.3 | 844 | | | | |
| (CORRECTED | TOTAL) | 8 | 1226 | 6666.3 | 049 | | | | |
| PARAMETER | ESTIMATE | | ASYM | PTOTIC | : | ASY | PTOI | TIC 95 % | |
| | | | STD. | ERROR | | CONFIL | DENCE | INTERVAL | |
| | | | | | | LOWER | | UPPE | ₹ |
| A | 21.23601132 | 5 | .15076 | 658640 | 6. | .9353861501 | 35. | 536636491 | 7 |
| В | 0.05164370 | 0 | .0657 | 715049 | -0. | 1309648049 | 0. | 234252199 | • |
| C | -1.27892455 | 0 | .11354 | 469836 | -1. | 5941772476 | -0. | 963671845 | 5 |
| D | 0.01528574 | 0 | .04225 | 549676 | -0. | 1020312726 | 0. | 132602749 | • |
| E | -0.00239225 | | | | - | 0208393265 | | 016054827 | |

| | | | | | | | | | | | • | | | | | |
|------|--------------|-----------|-------------|-------|------|------------|-------|--------|----------|--------|--------|------|---------------|-------|----------------------|-----|
| | 4 | | | _ | ~~ | 1 0 | 2000 | 40. | | | 4000 | | 0.54 | | 15 050 | |
| | 1 | | | | 22 | | | | | | | | | | 15.853 | |
| | 2 | 2 | | | 53 | | | 9.1 | | | 3665 | | | | -2.255 | |
| | 3 | 7 | | | 20 | | | 8.2 | | | 7717 | | | | -43.557 | |
| | 4 | 9 | 5 19 | 5 1 | 00 | 5.00 | 0000 | 8.2 | 0 | 8. | 1970 | 0 | .003 | 0 | 0.037 | |
| | 5 | 19 | 5 33 | 9 1 | 44 | 1.44 | 4000 | 7.8 | 2 | 7. | 7074 | 0 | .112 | 6 | 1.440 | |
| | 6 | 339 | 9 48 | 3 1 | 44 | | | 7.5 | | | | | | | -1.746 | |
| | 7 | | | | 44 | | | 7.8 | | | 8442 | | | | -0.309 | |
| | 8 | | | | 60 | | | 10.1 | | | | | | | 4.623 | |
| | 9 | | | | | | | | | | | | | | | |
| | 9 | 68 | 7 70 | , | 20 | 0.33 | 3333 | 13.6 | 4 1 | .J. | 1003 | U | . 539 | 1 | 3.952 | |
| | | | | | | | SY | /S=F-1 | 00 - | | | | | | | |
| | | | | | | | | | | | | | | | | |
| NON- | -LIN | VEAR 1 | LEAST | SQU | ARE | S SUN | MARY | STAT | 'ISTI | CS | | DEP: | ENDE | NT | VARIABLE | TCA |
| : | SOUE | RCE | | | | DF | SUM | of so | UARE | S | ì | ŒAN | SQU | ARE | Ε | |
| r | DEYE | RESSI | N. | | | 5 0 | 11 | .83564 | n 86 | Q | • | 267 | 128. | 174 | ì | |
| | | DUAL | <i>3</i> 24 | | | ň | 11 | | 0.00 | | 4 | 2307 | | 000 | | |
| | 1000 1000 | RREC | TT TT | OMB T | | 5 | 11 | | | | | | υ. | 000 | , | |
| , | JNC | KKEC. | יו טפוו | OTAL | | J | 11 | .83564 | U.86 | 9 | | | | | | |
| (| (COF | RECTI | ED TO | TAL) | | 4 | 2 | 08647 | 8.76 | 7 | | | | | | |
| E | PARA | METER | ₹ . | EST: | IMAT | Œ | ASY | MPTOT | IC | | | A | SYMP | TOT | IC 95 % | |
| | | | | | | | STD | . ERR | OR | | | CON | FIDE | NCE | INTERVA | L |
| | | | | | | | | | | | | LOW | ano ora | | ा १००५ | 2 |
| 2 | A | | 3. | 95700 | ากก | 10 | | | Ω | 3 (| 5700 | 1003 | 30 | 2 0 | 57000039 84653773 | 2 |
| | 3 | | _0 | 2016 | 5377 | 73 | | | ο Ο _ |) · : | 20100 | 277 |) | J.J | 0.4652772 | A . |
| | | | -0. | 3040: | 7071 | 7.3 N.A | | | 0 - | ٠., | 30403 | 2// | 34 - | 0.3 | 47076724 | 4 |
| (| | | -0. | 34/0 | 10/3 | 34 | | | U - | ۷., | 34/8/ | 6/3 | 4U - | 0.3 | 47876734 |) |
| I | | | | | | 76 | | | 0 - | 0.2 | 27451 | .767 | 59 - 1 | 0.2 | 74517675 | • |
| E | C | | 0.0 | 01096 | 5789 | 97 | | | 0 | 0.0 | 01096 | 789 | 71 | 0.0 | 10967897: | L |
| | | | | | | | | | | | | | | | | |
| I | OT | $X\Gamma$ | ΧU | ΥI | | R | AUC | UCP | | | Г | IF | | | PCT | |
| | | | | | | | | | | | | | | | | |
| | 1 | 0 | 23 | 23 | 1. | 0000 | 6.5 | 1 6.5 | 1 3 | .33 | 3067E | -16 | 5.3 | 116 | 24E-15 | |
| | 2 | 23 | 568 | 545 | | | | | | | | | | | 08E-15 | |
| | 3 | | | | | | | | | | | | | | 62E-14 | |
| | | | | | | | | | | | | | | | 41E-14 | |
| | | | | | | | | | | | | | | | 41E-14 45E-15 | |
| | כ | 1/20 | 2211 |) (CC | υ. | 7764 | 2.5 | 0 2.5 | U -5 | . 5: | OTT CE | -1/ | -2. | 220 | 40E-12 | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | - SY | S=F-1 | 01 - | | | | | | | |
| NON- | LIN | EAR L | EAST | SOUZ | RES | SUM | MARY | STAT | isti | CS | | ופאת | NDE | ידיוע | VARIABLE | TCA |
| | | | | - 200 | | | | ~ | | | | · | | | | |
| c | OUR | CTE | | | | חבר | CI IM | of sq | ממגו | c | M | EBRI | COLI | ישם | | |
| | | ESSIC | 182 | | | | 30L1 | പ്രധാന | ンロスピ | ว ว | 1 A | 126. | 17 01 | フンヘ | | |
| | | | /L¶ | | | 5 | 70 | 68239 | | | | | | | | |
| | | DUAL | | | | 1 | | 8620 | | | | 862 | 20.4 | /94 | | |
| U | INCO | RRECT | ED TO | JTAL | | 6 | 70 | 76859 | .844 | 6 | | | | | | |
| | | | | | | | | | | | | | | | | |
| (| COR | RECTE | D TO | (LAC | | 5 | 22 | 00718 | . 464 | 3 | | | | | | |
| | | | | | | | | | | | | | | | | |

LOT XL XU YI R AUC UCP DIF PCT

| FMI | AMETE | R | estim | ATE | | (MPTOTIC | | | TOTIC 95 % |
|--|-----------------------------------|---|---|---|--|---|---|--|---|
| A B | | | 11407 28262 | | 16.91 | | -184.8 | LOWER | UPPER 245.07414975 0.72796922 |
| С | | -0. | 92075 | 123 | 0.16 | 2521380 | -2.9 | 8574789 | 1.14424543 |
| D | | -0. | 10127 | 519 | 0.07 | 79440492 | 2 -1.1 | 1064608 | 0.90809571 |
| E | | 0. | 02276 | 889 | 0.01 | 18622788 | -0.2 | 1385225 | 0.25939004 |
| LOT | ХГ | χυ | IX | R | | AUC | UCP | DIF | PCT |
| 1 | 0 | 31 | 31 | 1.0 | 0000 | 16.85 | 15.9455 | 0.9045 | 2 5.3681 |
| 2 | 31 | 115 | 84 | | 0968 | 7.58 | 8.0942 | | |
| 3 | 115 | 424 | 309 | | | | 6.8948 | | |
| 4 | 424 | 630 | 206 | | | | 5.7691 | | |
| 5 | 630 | 714 | 84 | | | | 5.7559 | | 0 -9.2201 |
| 6 | 714 | | 93 | | | 5.22 | 4.5168 | | |
| | | | | | | - 122 | | | |
| | | | | | SY | S=F-102 | | | |
| NON-LI | NEAR I | EAST | SQUARI | es si | UMMARY | STATIS | TICS | DEPENDE | NT VARIABLE TCA |
| SOUE REGE | RCE RESSIO | ON O | | | | OF SQUA | | MEAN SQU | |
| RESI | DUAL | | | (| 0 | 0.0 | 000 | 0.0 | 000 |
| UNC | ORRECT | TED TO | TAL | • | 4 44 | 62706.4 | 660 | | |
| (COF | RECTE | ED TOT | AT.) | | 3 17 | 95723.5 | 170 | | |
| , 551 | | | · , | • | J 1. | 30,20.0 | 117 | | |
| · | METER | | estimi | | ASY | MPTOTIC | | CONFIDE | TOTIC 95 % NCE INTERVAL |
| PAR! | AMETER | ₹ 1 | estim | ATE | ASY | MPTOTIC | ; | CONFIDER LOWER | NCE INTERVAL UPPER |
| PARA A | AMETER | 2.9 | ESTIM 124270 | ATE 078 | ASY | MPTOTIC ERROR | 2.912 | CONFIDER LOWER 4270782 | NCE INTERVAL UPPER 2.9124270782 |
| PARA A B | AMETER | 2.9: -0.5 | ESTIMA 124270 904308 | ATE 078 358 | ASY | MPTOTIC ERROR | 2.9124 -0.590 | CONFIDER LOWER 4270782 (4308580 ~(| NCE INTERVAL UPPER 2.9124270782 0.5904308580 |
| PARA A B C | AMETEF | 2.9 -0.5 -0.2 | ESTIMA 12427(904308 580385 | ATE 078 358 597 | ASY | MPTOTIC ERROR | 2.9124 -0.5904 -0.2580 | CONFIDER LOWER 4270782 (4308580 ~(0385966 ~(| NCE INTERVAL UPPER 2.9124270782 0.5904308580 0.2580385966 |
| PARA B C D | AMETER | 2.9: -0.5: -0.2: -0.0: | ESTIM 124270 904308 580385 105535 | ATE 078 358 597 539 | ASY | MPTOTIC ERROR | 2.9124 -0.5904 -0.2580 -0.010 | CONFIDER LOWER 4270782 (4308580 ~(0385966 ~(5535395 ~(| NCE INTERVAL UPPER 2.9124270782 0.5904308580 0.2580385966 0.0105535395 |
| PARA A B C | AMETER | 2.9: -0.5: -0.2: -0.0: | ESTIMA 12427(904308 580385 | ATE 078 358 597 539 | ASY | MPTOTIC ERROR | 2.9124 -0.5904 -0.2580 -0.010 | CONFIDER LOWER 4270782 (4308580 ~(0385966 ~(5535395 ~(| NCE INTERVAL UPPER 2.9124270782 0.5904308580 0.2580385966 |
| PARA B C D E | | 2.9 -0.5 -0.2 -0.0 | ESTIMA 124270 904308 580385 105535 039377 | O78 358 597 539 765 | ASY STD | MPTOTIC ERROR | 2.9124 -0.5904 -0.2580 -0.0109 | CONFIDER LOWER 4270782 (4308580 ~(0385966 ~(5535395 ~(| NCE INTERVAL UPPER 2.9124270782 0.5904308580 0.2580385966 0.0105535395 |
| PARA B C D E | ХL | 2.9 -0.5 -0.2 -0.0 -0.0 | ESTIM 124270 904308 580385 105535 039377 | ATE 078 358 597 539 765 | ASY STD | MPTOTIC ERROR 0 0 0 0 | 2.9124 -0.5904 -0.2580 -0.0109 | CONFIDER LOWER 4270782 (4308580 ~(0385966 ~(5535395 ~(9377645 ~(| NCE INTERVAL UPPER 2.9124270782 0.5904308580 0.2580385966 0.0105535395 0.0039377645 |
| PARA B C D E LOT | XL 0 | 2.9: -0.5: -0.2: -0.0: -0.0: XU Y: | ESTIM 124270 904308 580385 105535 039377 I R | ATE 078 358 597 539 765 | ASY STD | MPTOTIC ERROR 0 0 0 0 0 0 0 0 | 2.9124 -0.5904 -0.2580 -0.0109 -0.0039 | CONFIDER LOWER 4270782 : 4308580 ~(0385966 ~(5535395 ~(9377645 ~(| NCE INTERVAL UPPER 2.9124270782 0.5904308580 0.2580385966 0.0105535395 0.0039377645 PCT 90433E-15 |
| PARA B C D E LOT | XL 0 37 1 | 2.9. -0.5. -0.2. -0.0. -0.0. XU Y | 124270 904308 580385 105535 039377 I R 7 1.00 | 778 358 597 539 765 | ASY STD AUC 11.66 5.17 | MPTOTIC DERROR 0 0 0 0 0 0 0 0 0 0 0 0 11.66 5.17 | 2.9124 -0.5904 -0.2580 -0.0109 -0.0039 | CONFIDER LOWER 4270782 : 4308580 -(0385966 -(5535395 -(9377645 -(DIF | NCE INTERVAL UPPER 2.9124270782 0.5904308580 0.2580385966 0.0105535395 0.0039377645 PCT 90433E-15 29487E-15 |
| PARA B C D E LOT 1 2 3 | XL 0 37 1 145 7 | 2.9. -0.5. -0.2. -0.0. -0.0. XU Y | 124270 904308 580385 105535 039377 I R 7 1.00 8 2.91 2 5.20 | 778 358 597 539 765 0000 1892 | AUC 11.66 5.17 3.50 | MPTOTIC D. ERROR 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 2.9124 -0.5904 -0.2580 -0.010! -0.0039 | CONFIDER LOWER 4270782 : 4308580 -(0385966 -(05535395 -(0377645 -(01F 5E-16 -1.9 5E-16 -1.9 | NCE INTERVAL UPPER 2.9124270782 0.5904308580 0.2580385966 0.0105535395 0.0039377645 PCT 90433E-15 29487E-15 17207E-15 |
| PARA B C D E LOT 1 2 3 | XL 0 37 1 145 7 | 2.9. -0.5. -0.2. -0.0. -0.0. XU Y | 124270 904308 580385 105535 039377 I R 7 1.00 8 2.91 2 5.20 | 778 358 597 539 765 0000 1892 | AUC 11.66 5.17 3.50 | MPTOTIC D. ERROR 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 2.9124 -0.5904 -0.2580 -0.010! -0.0039 | CONFIDER LOWER 4270782 : 4308580 -(0385966 -(05535395 -(0377645 -(01F DIF 5E-16 -1.5 | NCE INTERVAL UPPER 2.9124270782 0.5904308580 0.2580385966 0.0105535395 0.0039377645 PCT 90433E-15 29487E-15 17207E-15 |
| PARA B C D E LOT 1 2 3 | XL 0 37 1 145 7 707 8 | 2.9: -0.5: -0.2: -0.0: -0.0: XU Y: 37 3: 45 10: 37 56: 347 14: | 124270 904308 580385 105535 039377 I R 7 1.00 3 2.91 2 5.20 0 0.24 | 078 858 597 539 765 0000 1892 0370 | AUC 11.66 5.17 3.50 2.21 | MPTOTIC D. ERROR 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 2.9124 -0.5904 -0.2580 -0.0109 -0.0039 -2.22049 -1.11022 2.77556 | CONFIDER LOWER 4270782 : 4308580 -(5535395 -(9377645 -(DIF 5E-16 -1.9 5E-16 -3.1 5E-16 1.2 | NCE INTERVAL UPPER 2.9124270782 0.5904308580 0.2580385966 0.0105535395 0.0039377645 PCT 90433E-15 29487E-15 17207E-15 |
| PARA B C D E LOT 1 2 3 4 | XL 0 37 1 145 7 707 8 | 2.9: -0.5: -0.0: -0.0: XU Y: 37 3: 45 10: 707 56: 47 146 | 124270 904308 580385 105535 039377 I R 7 1.00 8 2.91 2 5.20 0 0.24 | 078 358 597 539 765 0000 1892 0370 | AUC 11.66 5.17 3.50 2.21 | MPTOTIC D. ERROR 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 2.9124 -0.5904 -0.2580 -0.0109 -0.0039 -2.22049 -1.11022 2.77556 | CONFIDER LOWER 4270782 : 4308580 -(0385966 -(05535395 -(0377645 -(01F DIF DE-16 -1.9 5E-16 -1.9 5E-16 1.2 | UPPER 2.9124270782 0.5904308580 0.2580385966 0.0105535395 0.0039377645 PCT 90433E-15 29487E-15 17207E-15 25591E-14 |
| PARA B C D E LOT 1 2 3 4 | XL 0 37 1 145 7 707 8 | 2.9: -0.5: -0.0: -0.0: XU Y: 37 3: 45 10: 707 56: 47 146 | 124270 904308 580385 105535 039377 I R 7 1.00 8 2.91 2 5.20 0 0.24 | 778 358 597 539 765 0000 1892 0370 1911 | AUC 11.66 5.17 3.50 2.21 SY | MPTOTIC DERROR 0 0 0 0 0 0 0 0 0 0 0 0 0 | 2.9124 -0.5904 -0.2586 -0.0109 -0.0039 -2.22049 -1.11022 2.77556 | CONFIDER LOWER 4270782 : 4308580 -(0385966 -(5535395 -(9377645 -(DIF 5E-16 -1.9 5E-16 4.3 2E-16 -3.3 5E-16 1.3 | PCT 90433E-15 29487E-15 17207E-15 25591E-14 UPPER 2.9124270782 0.5904308580 0.2580385966 0.0105535395 0.0039377645 PCT |
| PARA A B C D E LOT 1 2 3 4 NON-LIN SOUR | XL 0 37 1 145 7 707 8 | 2.9: -0.5: -0.2: -0.0: -0.0: XU Y: 37 3' .45 10: 07 56: 347 14: | 124270 904308 580385 105535 039377 I R 7 1.00 8 2.91 2 5.20 0 0.24 | 078 858 597 539 765 0000 1892 0370 1911 | AUC 11.66 5.17 3.50 2.21 SY JMMARY | MPTOTIC DERROR O O O O O O O O O O O O | 2.9124 -0.5904 -0.2586 -0.0109 -0.0039 -2.22049 -1.11022 2.77556 | CONFIDER LOWER 4270782 : 4308580 -(0385966 -(5535395 -(9377645 -(DIF 5E-16 -1.9 5E-16 4.3 2E-16 -3.1 DEPENDER | UPPER 2.9124270782 0.5904308580 0.2580385966 0.0105535395 0.0039377645 PCT 90433E-15 17207E-15 17207E-15 25591E-14 NT VARIABLE TCA ARE |
| PARA A B C D E LOT 1 2 3 4 NON-LIN SOUR | XL 0 37 1 145 7 707 8 | 2.9: -0.5: -0.2: -0.0: -0.0: XU Y: 37 3' .45 10: 07 56: 347 14: | 124270 904308 580385 105535 039377 I R 7 1.00 8 2.91 2 5.20 0 0.24 | 078 858 597 539 765 0000 1892 0370 1911 | AUC 11.66 5.17 3.50 2.21 SY JMMARY | MPTOTIC . ERROR 0 0 0 0 0 0 0 0 0 0 0 0 0 | 2.9124 -0.5904 -0.2586 -0.0109 -0.0039 -2.22049 -1.11022 2.77556 | CONFIDER LOWER 4270782 : 4308580 -(0385966 -(5535395 -(9377645 -(DIF 5E-16 -1.9 5E-16 4.3 2E-16 -3.3 5E-16 1.3 | UPPER 2.9124270782 0.5904308580 0.2580385966 0.0105535395 0.0039377645 PCT 90433E-15 29487E-15 17207E-15 25591E-14 NT VARIABLE TCA ARE 183 |

UNCORRECTED TOTAL 4 4765078.8733 (CORRECTED TOTAL) 3 480903.3427 PARAMETER ESTIMATE ASYMPTOTIC ASYMPTOTIC 95 % CONFIDENCE INTERVAL STD. ERROR LOWER 0 8.7059949788 8.7059949788 8.705994979 A -0.538191590 0 -0.5381915901 -0.5381915901 C 0 -0.1000696176 -0.1000696176 -0.100069618 0 -0.2431085572 -0.2431085572 -0.243108557 D 0 0.0406723237 0.0406723237 0.040672324 E LOT XL XU YI R AUC UCP DIF 0 4, 42 1.00000 34.19 34.19 8.88178E-16 2.59777E-15 42 130 88 2.09524 10.54 10.54 -8.88178E-16 -8.42674E-15 3 130 175 45 0.51136 11.64 11.64 -4.44089E-16 -3.81520E-15 4 175 340 165 3.66667 7.59 7.59 ----- SYS=F-15AB ------NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA DF SUM OF SQUARES MEAN SQUARE SOURCE 5 10242798.539 2048559.708 REGRESSION 4843.520 RESIDUAL 1 4843.520 UNCORRECTED TOTAL 6 10247642.059 (CORRECTED TOTAL) 5 1585918.021 PARAMETER ESTIMATE ASYMPTOTIC ASYMPTOTIC 95 % CONFIDENCE INTERVAL STD. ERROR LOWER 28.40889477 12.214770553 -126.79197987 183.60976942 Α -0.14928381 0.065766639 -0.98491473 В 0.68634711 C -0.93147080 0.196329082 -3.42602811 1.56308652 -0.00877048 0.047709730 -0.61497030 0.59742934D E LOT XL XU YI R AUC UCP DIF PCT 30 1.00000 25.597 24.7881 0.80894 3.1603 0 30 1 62 2.06667 19.556 19.7410 -0.18500 -0.9460 72 1.16129 17.183 17.9070 -0.72405 -4.2137 2 30 92 3 92 164 164 272 108 1.50000 17.126 16.8441 0.28194 1.6462 4 5 272 296 24 0.22222 16.021 15.1099 0.91114 5.6872

296 404 108 4.50000 16.272 16.2726 -0.00061 -0.0038

| SYS=F-15CD | |
|----------------|--|
| | |

| NON-LINE | EAR LE | ast s | QUAR | es summai | RY STATIS | TICS | DEPENDENT | T VARIABLE TCA |
|----------|--------|-------|------|-----------|------------|----------|-----------|----------------|
| SOURC | E | | | DF SUM | 1 OF SQUA | res n | EAN SQUAF | Œ |
| | SSION | I | | | 3408519.8 | | 81703.977 | |
| RESIL | | | | 3 | 10329.2 | | 3443.086 | |
| UNCOR | RECTE | D TOT | 'AL | 8 8 | 3418849.1 | 462 | | |
| | | | | | | | | |
| (CORE | ECTED | TOTA | L) | 7 | 752208.0 | 946 | | |
| PARAM | ETER | E | STIM | ATE AS | SYMPTOTIC | | ASYMPTO | TIC 95 % |
| | | | | SI | TD. ERROR | | CONFIDENC | E INTERVAL |
| | | | | | | | LOWER | UPPER |
| A | | 118. | 4565 | 394 122 | 25912839 | -270.633 | | 7.54621551 |
| В | | | 0754 | | .07643225 | -0.318 | | 0.16783788 |
| С | | -1. | 4984 | | . 19017008 | | | -0.89320578 |
| D | | 0. | 1672 | 946 0. | . 46833405 | -1.323 | | 1.65776766 |
| E | | -0. | 0319 | 244 0. | . 23019699 | -0.764 | 152637 | 0.70067749 |
| LOT | ХL | χU | ΥI | R | AUC | UCP | DIF | PCT |
| 201 | 7.1 | A.O | 4. | ** | 1100 | | 011 | |
| 1 | 0 | 97 | 97 | 1.00000 | 17.249 | 17.2381 | 0.0109 | 0.0632 |
| 2 | 97 | 175 | 78 | 0.80412 | 15.588 | 15.3315 | 0.2565 | 1.6455 |
| 2 3 | 175 | 235 | 60 | 0.76923 | 15.508 | 16.1558 | -0.6478 | -4.1773 |
| 4 | 235 | 277 | 42 | 0.70000 | 17.665 | 17.6862 | -0.0212 | -0.1202 |
| 5 | 277 | 313 | 36 | 0.85714 | 19.943 | 19.8749 | 0.0681 | 0.3413 |
| 6 | 313 | 352 | 39 | 1.08333 | 19.308 | 20.8517 | -1.5437 | -7.9949 |
| 7 | 352 | 388 | 36 | 0.92308 | 21.954 | 20.0546 | 1.8994 | 8.6517 |
| 8 | 388 | 436 | 48 | 1.33333 | 21.017 | 20.7982 | 0.2188 | 1.0409 |
| | | | | _ | wa n 15n | | | |
| | | | | 5 | SYS=F-15E | | | |

NOTE: THE RESIDUAL SS HAS FAILED TO CONVERGE IN THE SPECIFIED NUMBER OF ITERATIONS.

| LOT | ХL | ΧU | YI | R | AUC | UCP | DIF | PCT |
|-----|-----|-----|----|---------|--------|-----|-----|-----|
| 1 | 0 | 60 | 60 | 1.00000 | 20.544 | • | • | • |
| 2 | 60 | 132 | 72 | 1.20000 | 19.203 | | • | |
| 3 | 132 | 228 | 96 | 1.33333 | 17.608 | • | | • |
| 4 | 228 | 324 | 96 | 1.00000 | 16.175 | • | | • |
| 5 | 324 | 420 | 96 | 1.00000 | 16.041 | • | • | • |
| 6 | 420 | 516 | 96 | 1.00000 | 17.927 | • | • | • |
| | | | | | | | | |

------ SYS=F-16AB -----

NOTE: THE RESIDUAL SS HAS FAILED TO CONVERGE IN THE SPECIFIED NUMBER OF ITERATIONS.

| LOT | ХĽ | υx | YI | R | AUC | UCP | DIF | PCT |
|-----|-----|-----|-----|---------|-------|-----|-----|-----|
| 1 | 0 | 105 | 105 | 1.00000 | 10.14 | | | |
| 2 | 105 | 250 | 145 | 1.38095 | 7.74 | • | • | • |
| 3 | 250 | 425 | 175 | 1.20690 | 8.04 | • | • | |
| 4 | 425 | 605 | 180 | 1.02857 | 5.05 | • | • | • |
| 5 | 605 | 725 | 120 | 0.66667 | 5.13 | • | • | • |
| | | | | | | | | |

------ SYS=F-16E ------

NOTE: THE RESIDUAL SS HAS FAILED TO CONVERGE IN THE SPECIFIED NUMBER OF ITERATIONS.

| LOT | XL | XU | YI | R | AUC | UCP | DIF | PCT |
|-----|------|------|-----|---------|-------|-----|-----|-----|
| 1 | 0 | 120 | 120 | 1.00000 | 9.86 | • | | • |
| 2 | 120 | 264 | 144 | 1.20000 | 10.58 | • | • | |
| 3 | 264 | 414 | 150 | 1.04167 | 14.55 | | • | |
| 4 | 414 | 630 | 216 | 1.44000 | 11.93 | • | | |
| 5 | 630 | 846 | 216 | 1.00000 | 11.28 | • | • | |
| 6 | 846 | 1062 | 216 | 1.00000 | 11.02 | • | | |
| 7 | 1062 | 1278 | 216 | 1.00000 | 10.88 | | | |
| 8 | 1278 | 1494 | 216 | 1.00000 | 10.69 | | • | • |
| 9 | 1494 | 1710 | 216 | 1.00000 | 10.61 | | | |
| 10 | 1710 | 1926 | 216 | 1.00000 | 10.54 | • | • | • |
| | | | | | | | | |

C.6.3 - Electronics Programs

----- SYS=ARC-109V -----

| NON-LINEAR LEAST | SQUARES SUMMAR | Y STATISTICS | DEPENDENT VARIABLE TCA |
|------------------|----------------|--------------|------------------------|
| | | | |

 SOURCE
 DF
 SUM OF SQUARES
 MEAN SQUARE

 REGRESSION
 5
 66.744073730
 13.348814746

 RESIDUAL
 0
 0.000000000
 0.000000000

 UNCORRECTED TOTAL
 5
 66.744073730
 0.000000000

(CORRECTED TOTAL) 4 29.010182832

| PARAMETER | | ESTIMATE | ASYMPTOTIC | ASYMPTOTIC 95 % | | | | | |
|-----------|---|-------------|------------|-----------------|---------------|--|--|--|--|
| | | | STD. ERROR | CONFID | ENCE INTERVAL | | | | |
| | | | | LOWER | UPPER | | | | |
| A | 0 | .0146272785 | 0 | 0.01462727850 | 0.01462727850 | | | | |
| В | - | .5732392562 | 0 | 57323925617 | 57323925617 | | | | |
| С | - | .0544552721 | 0 | 05445527211 | 05445527211 | | | | |
| D | _ | .1365562160 | 0 | 13655621600 | 13655621600 | | | | |
| E | 0 | .0180417909 | 0 | 0.01804179095 | 0.01804179095 | | | | |

```
DIF PCT
  LOT XL XU YI R AUC UCP
             4 1.00000 0.0487 0.0487
             24 6.00000 0.0393 0.0393 -8.67362E-19 -2.20703E-15
      28 107 79 3.29167 0.0285 0.0285 -3.03577E-18 -1.06518E-14
   4 107 333 226 2.86076 0.0313 0.0313 8.67362E-19 2.77112E-15
   5 333 441 108 0.47788 0.0303 0.0303 -5.20417E-18 -1.71755E-14
         ----- SYS=ARC-54 ------
ERROR: ON OBSERVATION 6, USE OF THE ABOVE PARAMETERS HAS RESULTED IN A
      DERIVATIVE OR RESIDUAL IN EXCESS OF 1E30. ITERATIONS TERMINATED.
                               R AUC UCP DIF PCT
    LOT
                 ΧU
                       ΥI
          X\Gamma
                900 900 1.0000 0.0210 . .
      1
          0
          900 1753 853 0.9478 0.0165
               3134
                       1381
                             1.6190 0.0164
          1753
        3134
               4294 1160 0.8400 0.0145
        4294 4594 300 0.2586 0.0144
              7697
         4594
                       3103 10.3433 0.0139
                10347 2650 0.8540 0.0143
          7697
  NON-LINEAR LEAST SOUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA
                    DF SUM OF SQUARES MEAN SQUARE
   SOURCE
                     5 27730.837094
   REGRESSION
                                       5546.167419
                                         2.225580
   RESIDUAL
                      5
                          11.127902
   UNCORRECTED TOTAL 10 27741.964996 (CORRECTED TOTAL) 9 14794.094157
                         ASYMPTOTIC
                                           ASYMPTOTIC 95 %
   PARAMETER ESTIMATE
                                        CONFIDENCE INTERVAL
                         STD. ERROR
                                          LOWER
            0.678269504 0.93091584111 -1.7146911636 3.0712301721
   A
            -0.088463668 0.11590072096 -0.3863916377 0.2094643019
   В
   C
            -1.173255343 0.12203697556 -1.4869568287 -0.8595538571
            0.086542728 0.02866133425 0.0128674909 0.1602179656
           -0.032473882 0.01069228110 -0.0599588677 -0.0049888972
   E
                                             DIF
      \chi_{\Gamma}
           XU YI R AUC UCP
                                                       PCT
  LOT
        0
           781 781 1.00000 0.1866 0.186625 -0.000025 -0.013
    1
           930 149 0.19078 0.1744 0.169378 0.005022
                                                       2.880
       781
    2
       930 1217 287 1.92617 0.1769 0.178303 -0.001403
                                                      -0.793
    3
      1217 1358 141 0.49129 0.1817 0.181340 0.000360
                                                       0.198
      1358 1450 92 0.65248 0.1772 0.197918 -0.020718 -11.692
1450 1585 135 1.46739 0.2189 0.200671 0.018229 8.328
    5
    7 1585 1693 108 0.80000 0.1911 0.196452 -0.005352
                                                      -2.801
    8 1693 1851 158 1.46296 0.1917 0.194390 -0.002690 -1.403
    9 1851 1887 36 0.22785 0.2005 0.199715 0.000785
                                                      0.391
```

10 1887 1923

36 1.00000 0.2145 0.226862 -0.012362 -5.763

| | | | | | - SYS=ASN | -70 | | | | |
|---------|-------|------------|---------|----------|------------------------|----------------|----------------------|--|--|--|
| NON-LI | NEAR | | | | ARY STAT | | DEPENDENT | VARIABLE TCA | | |
| SOU | RCE | | | DF S | SUM OF SQU | JARES | MEAN SQUAR | E | | |
| REG | RESS: | ION | | 5 | 119.454 | | 23.8909034 | | | |
| RES | IDUA | Ĺ | | 3 | 0.001 | 18135 | 0.0004937 | 8 | | |
| UNC | ORRE | CTED 1 | COTAL | 8 | 119.4559 | 9881 | | | | |
| (00) | RREC | TED TO | TAL) | 7 | 64.1896 | 58336 | | | | |
| PAR | AMETI | E R | estim | ATE | ASYMPTOTI STD. ERRO | | CONFIDENC | ASYMPTOTIC 95 % CONFIDENCE INTERVAL | | |
| A | | 0 | 049631 | 948 0 0 | 050720076 | :n n n n n n n | LOWER 06200504 0. | UPPER | | |
| В | | | | | | | 58786693 O. | | | |
| C | | | | | | | 38330156 <i>-</i> 1. | | | |
| Ď | | | | | | | 59959622 0. | | | |
| E | | | | | 088996168 | | | 0308309927 | | |
| | V | | | | | | | | | |
| LOT | ХĽ | ΧU | YI | R | AUC | UCP | DI | F PCT | | |
| 1 | 0 | 152 | 152 | 1.00000 | 0.0350 | 0.03499 | 992 0.0000 | 0.0024 | | |
| 2 | 152 | 402 | 250 | 1.64474 | 0.0353 | 0.03530 | 010 -0.0000 | 010 -0.0029 | | |
| 3 | 402 | 483 | 81 | 0.32400 | 0.0342 | 0.03419 | 0.0000 | 0.0178 | | |
| 4 | 483 | 541 | 58 | 0.71605 | 0.0356 | 0.03559 | 78 0.0000 | 0.0062 | | |
| 5 | 541 | 567 | 26 | 0.44828 | 0.0370 | 0.03704 | 188 -0.0000 | | | |
| 6 | 567 | 575 | 8 | 0.30769 | 0.0399 | 0.03997 | 702 -0.0000 | 702 -0.1759 | | |
| 7 | 575 | 583 | | 1.00000 | | 0.04069 | 29 -0.00369 | 929 -9.9808 | | |
| 8 | 583 | 594 | 11 | 1.37500 | 0.0427 | 0.04046 | 0.0022 | 385 5.2423 | | |
| | | | | | SYS=ASN- | 99 | | | | |
| | | | | | | | | | | |
| NON-LIN | VEAR | LEAST | SQUAR | es summ | ARY STATI | STICS | DEPENDENT | VARIABLE TCA | | |
| SOUT | (Œ | | | DF S | UM OF SQU | ARES | MEAN SQUARE | 3 | | |
| REG | ŒSSI | ON | | 5 | 382.2942 | 6152 | 76.45885230 |) | | |
| RESI | DUAL | • | | 3 | 1.3093 | 4762 | 0.43644921 | <u> </u> | | |
| UNCC | RREC | TED T | OTAL | 8 | 383.6036 | 0914 | | | | |
| (COF | RECT | er 10 | TAL) | 7 | 61.2115 | 4176 | | | | |
| PARA | METE | R | ESTIM | | ASYMPTOTI | | ASYMPTOT | 'IC 95 % | | |
| | | | | ; | STD. ERRO | R | CONFIDENCE | | | |
| A | | Ω | 4132086 | 326 U 20 | 1040EQE62 | 7 _0 542 | LOWER 8362023 1.3 | UPPER | | |
| В | | | | | | | 4970983 0.1 | | | |
| Ċ | | | | | | | 5395990 -1.0 | | | |
| D | | | | | | | 1889155 0.5 | | | |
| E | | | | | 272852077 | | | 344170999 | | |
| ~ | | • | : | | | . 0.103 | TARKILL O.O | A 12710777 | | |

| LOT | XT | χτ _. | J Y | Ι | R | | AU | c | UCE | • | Ī | OIF | PCT |
|--|--|-----------------|------------|------------|-------|------|------|---------|-------|--------|----------------|-------|-----------|
| 1 | 0 | 15 | .7 | 157 | 1 00 | 0000 | n | .0464 | 0.04 | 134344 | 0.00 | 2966 | 6.391 |
| 2 | 157 | | | 196 | | 4841 | | .0404 | | 150313 | | 14631 | -11.464 |
| 3 | 353 | 53 | | 185 | 0.94 | | | .0413 | | 398728 | |)1427 | 3.456 |
| 4 | 538 | 78 | | 243 | | 1351 | | .0433 | | 26104 | | 00690 | 1.593 |
| 5 | 781 | | | 24 | | 9877 | | | | 74564 | | L0456 | -18.344 |
| 6 | 805 | | 7 | | 3.00 | | | .0624 | | 42077 | | | -2.897 |
| 7 | 877 | | 3 | | | | | .0635 | | 41983 | | 00698 | |
| - 8 | 933 | | | 117 | 2.08 | | | .0684 | | 58455 | 0.00 | | 3.735 |
| | | | _ | | | | | | | | | | |
| | | | | | _~ | 51 | (5=) | ASN-10 | 8 | | | | |
| NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA SOURCE DF SUM OF SQUARES MEAN SQUARE | | | | | | | | | | | | | |
| SOU | RCE | | | | DF | SUN | 1 0 | F SQUA | RES | MEA | N SQUA | RE | |
| REG | RESS: | ION | | | 5 | ; 5 | 560 | .63059 | 524 | 112. | 126119 | 05 | |
| | IDUA | | | | (|) | 0 | .00000 | | 0. | 000000 | 000 | |
| UNC | ORREX | CTED | TOT | AL | 5 | ; 5 | 560 | .63059 | 524 | | | | |
| | | | | | | | | | | | | | |
| (00 | RREC | red T | OTA | L) | 4 | 1 2 | 226 | .66710 | 333 | | | | |
| PAR | AMETI | D R | E | STIM | ATE | AS | SYMI | PTOTIC | | | ASYMPT | OTIC | 95 % |
| | PARAMETER ESTIMATE ASYMPTOTIC ASYMPTOTIC 95 % STD. ERROR CONFIDENCE INTERVAL | | | | | | | | | | | | |
| | | | | | | | | | | | | | UPPER |
| A | | | | 0075 | | | | | | 800750 | | | |
| В | | | | 6390 | | | | | | 763902 | | | |
| C | | | | 1819 | | | | | | 418197 | | | |
| D | | | | 8505 | | | | | | 785055 | | | |
| E | | υ. | 0240 | 0188 | 462 | | | U | 0.02 | 401884 | 625 0. | 02401 | 884625 |
| LOT | XT | υχ | YI | R | | AUC | | UCEP | | D | IF | | PCT |
| 1 | 0 | 8 | 8 | 1.0 | 0000 | 0.13 | 373 | 0.137 | 3 | | 0 | | 0 |
| 2 | 8 | 39 | 31 | 3.8 | 7500 | 0.10 | 148 | 0.104 | 8 -1. | 73472E | -18 - 1 | .6552 | 7E-15 |
| 3 | | 116 | 77 | 2.4 | 3387 | 0.08 | 74 | 0.087 | 4 5. | 20417E | -18 5 | .9544 | 3E-15 |
| 4 | | | | | | | | | | 46945E | | .6791 | 6E-15 |
| 5 | 332 | 440 | 108 | 0.5 | 0000 | 0.08 | 172 | 0.087 | 28. | 67362E | -18 9 | .9468 | LE-15 |
| | | | | | | SY | 'S=1 | NSO-13 | 3 | | | | |
| SYS=ASQ-133 | | | | | | | | | | | | | |
| NON-LI | NEAR | LEAS | T S | QUARI | es su | MMAR | Y S | STATIS | rics | DE | PENDEN | T VAR | IABLE TCA |
| SOU | RŒ | | | | DF | SUM | OF | SQUA | RES | MEA | N SQUA | RE | |
| REG | RESS I | ON | | | | | | 2.9126 | 562 | 576 | .58253 | 32 | |
| | IDUAL | | | | | | 1 | L.8574 | 302 | 1 | .85743 | | |
| UNO | ORREX | TED ' | TOTA | A L | 6 | 2 | 884 | 1.77009 | 964 | | | | |
| (CO) | RRECT | ED T | OTAL | (۲) | 5 | ı | 403 | 3.6845 | 454 | | | | |

| PAR | METER | | ESTI | MATE | ASYMPTOTI | | ASYMPTO: CONFIDENCE | E INTERVAL |
|------------------|------------|---------------------|-------------------------|----------------------------------|--|---|--------------------------|---|
| A B C D | | -0.0 -1.3 0.0 | 08591 21652 06572 | 6155 0.1 4781 0.2 0464 0.0 | .007061180 :509918493 :866559267 | 06 -4.52161 05 -1.36548 08 -4.40562 08 -1.03532 01 -0.23718 | 272195 1.9 297421 1.1 | UPPER 7768346244 L936557805 9725776571 L667706694 2114094302 |
| E | | -0. | 01200 | 3212 0.0 | 11/0525543 | or -0.23/10 | 004012 0.2 | |
| LOT | XL | χU | ΥI | R | AUC | UCP | DIF | PCT |
| 1 2 | 0 14 | 14 33 | 14 19 | 1.00000 1.35714 | 0.5862 | 0.638393 0.552513 | -0.052793 0.033687 | 7 5.7467 |
| 3 | 33 | 101 | 68 | 3.57895 | | 0.425465 0.371279 | 0.000039 | |
| 4 5 | 101 168 | 168 249 | 67 81 | 0.98529 | | 0.371279 | -0.005931 | |
| 6 | 249 | 307 | 58 | 0.71605 | | 0.340216 | -0.004716 | |
| | | | | | SYS=ASW- | .32 | | |
| | | | | | DID-904- | J2 | | |
| NON-LIN | VEAR L | east | SQUA | res summ | ARY STATI | STICS | DEPENDENT | VARIABLE TCA |
| SOUT | CE | | | DF S | UM OF SQU | JARES N | TEAN SQUARE | E |
| | ESSIO | N | | 5 | 300.6677 | | 50.13354219 | |
| | DUAL | | | 1 | | | 0.21036271 | L |
| UNC | RRECT | ED T | JIAL | ь | 300.8780 | 17368 | | |
| (COF | RECTE | D TO | ral) | 5 | 54.9029 | 8664 | | |
| PARA | METER | | ESTI | | ASYMPTOTI STD. ERRO | _ | ASYMPTOT CONFIDENCE | |
| | | | | | DID. Date | | LOWER | UPPER |
| A | | | .1297 | | - | 2 -228.188 | | .44808731 |
| В | | | .8025 | | .25159349 | | | 3.99928187 |
| C | | | .6111 | | .78062939 | _ | | 5.30756383 5.54812013 |
| D E | | | . 8433 . 5587 | | .37028059 .11737220 | | |).93254129 |
| ~ | | | | • | | | | |
| LOT | XL | XU | ΥI | R | AUC | UCP | DIF | PCT |
| 1 | 0 | 12 | 12 | 1.00000 | 0.2338 | 0.240501 | -0.006700 | 08 -2.8660 |
| 2 | 12 | 38 | 26 | 2.16667 | | 0.169911 | -0.005610 | |
| 3 | 38 | 86 | 48 | 1.84615 | | 0.146793 | 0.005607 | |
| 4 5 | 86 134 | 134 184 | 48 50 | 1.00000 | | 0.101842 0.139663 | -0.004441 0.004437 | |
| 5 6 | 184 | 264 | 80 | 1.60000 | | 0.153356 | -0.001555 | |
| • | | | - | _,,,,,,,, | | 3.23330 | J. JUL JU | |

| | | | | | SVS | :=CT9_1 | A351 | N | | | |
|---------|--------|-------|-------|--------|-------|---------|------|-----------|---------|---------|------------|
| | | | | | | | | | | | RIABLE TCA |
| | | | _ | | | | | | | | |
| SOU | RCE | | | DI | FSUM | OF SQ | UAR | ES | MEAN SC | UARE | |
| REG | RESSI | ON | | | 5 20 | 8.810 | 1193 | 46 7.4 | 41.7620 | 3869 | |
| RES | IDUAL | | ~~~~ | ; | . 20 | 0.43/ | 758 | 14 | 0.4379 | 158/4 | |
| UNC | ORREC | TED T | OLAL | | 5 20 | 9.248 | 132. | 20 | | | |
| (00) | RRECT | ED TO | TAL) | | 5 4 | 1.366 | 827 | 39 | | | |
| PAR | AMETE | R | ESTI | MATE | ASY | MPTOT | 'IC | | ASYM | PTOTIC | 95 % |
| | | | | | STD | . ERR | OR | | CONFIL | ENCE II | NTERVAL |
| | | | | | | | | | LOWER | | UPPER |
| A | | | | | | | | | 3703878 | | |
| В | | | | | | | | | 6348189 | | |
| С | | | | | | | | | 1791130 | | |
| D | | | | | | | | | 0623668 | | |
| E | | 0 | 29542 | 28257 | 0.266 | 47539 | 48 | -3.41 | 5379192 | 3.356 | 5293541 |
| LOT | ХL | χυ | YI | R | AU | С | U | œP | DIF | I | CT |
| 1 | 0 | 12 | 12 | 1.0000 | n n | 1248 | 0. | 138765 | -0.013 | 1965 -1 | 11.190 |
| 2 | | 38 | | 2.1666 | | 0903 | | | -0.012 | | |
| 3 | 38 | 86 | | 1.846 | | 1236 | | | 0.009 | | |
| 4 | 86 | | | 1.0000 | | 1287 | 0.3 | 131723 | -0.003 | 8023 - | -2.348 |
| 5 | 134 | | | 1.0416 | | 1310 | 0. | 126219 | 0.004 | 781 | 3.650 |
| 6 | 184 | 264 | | 1.6000 | | 1154 | 0.3 | 117898 | -0.002 | 2498 - | -2.164 |
| | | | | | SY | S=JTI | DS · | | | | |
| NOTE: T | HE RE | SIDUA | L SS | HAS F | AILED | TO CO | NVEI | RGE IN | THE SPE | CIFIED | NUMBER OF |
| ľ | TERAT | IONS. | | | | | | | | | |
| LOT | | | | | | | | | UCP | DIF | PCT |
| 1 | | | 45 | | | | | 0.406 | | • | • |
| 2 | • | | | | | | | | 4. | • | • |
| 3 | 1 | 21 | | 77 | | | | | | • | • |
| | | | | | | | | 0.230 | | • | • |
| 5 | 2 | 70 | 327 | 57 | 0. | 79167 | 1 | 0.220 | 5. | • | • |
| | | | | | SY | S=LAN | NAV | | | | |
| NON-LI | NEAR 1 | LEAST | SQUA | res su | MMARY | STAT | IST | ıcs | DEPEND | ent vaf | RIABLE TCA |

C - 80

DF SUM OF SQUARES

87339.225704

87339.230896

17386.822804

0.005192

5

2

7

SOURCE

REGRESSION

UNCORRECTED TOTAL (CORRECTED TOTAL)

RESIDUAL

MEAN SQUARE

17467.845141

0.002596

| PARA | ETE | ₹ | ES' | PIMATE | ASYMP | TOTIC | ASY | PTOTIC 95 % |
|------|-----|-----|------|----------|----------|---------|----------------|----------------|
| | | | | | STD. | ERROR | CONFI | DENCE INTERVAL |
| | | | | | | | LOWER | UPPER |
| A | | 1 | .820 | 347696 (| 0.015994 | 78698 | 1.7512269261 | 1.8888684659 |
| В | | -0 | .113 | 529232 (| .000529 | 66833 - | -0.1158082361 | -0.1112502283 |
| С | | -1 | .001 | 306001 (| .001809 | 32141 - | -1.0090909684 | -0.9935210340 |
| D | | -0 | .000 | 212656 (| .000136 | 14632 - | -0.0007984550 | 0.0003731437 |
| E | | 0 | .000 | 066777 (| .000023 | 53573 - | -0.0000344897 | 0.0001680447 |
| | | | | | | | | |
| LOT | XL | ΧU | ΥI | R | AUC | UCP | DIF | PCT |
| | | | | | | | | |
| 1 | 0 | 4 | 4 | 1.00000 | 1.7500 | 1.7506 | 52 -0.00062349 | -0.035626 |
| 2 | 4 | 38 | 34 | 8.50000 | 1.3199 | 1.3199 | 2 -0.0000179 | 5 -0.001361 |
| 3 | 38 | 176 | 138 | 4.05882 | 2 1.0761 | 1.0760 | 0.00000570 | 0.000529 |
| 4 | 176 | 320 | 144 | 1.04348 | 0.9679 | 0.9680 | 04 -0.00014280 | -0.014753 |
| 5 | 320 | 464 | 144 | 1.00000 | 0.9184 | 0.9180 | 0.00039000 | 0.042472 |
| 6 | 464 | 608 | 144 | 1.00000 | 0.8854 | 0.8856 | 8 -0.00027663 | L -0.031241 |
| 7 | 608 | | | | 0.8643 | | | 0.004471 |
| | | · | | | | | | |

----- SYS=LANTARP -----

NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA

| RE RE | URCE GRESS SIDUA CORRE | L | TOTAL | | 5 2 7 | | SQUA 3.849 0.030 3.880 | 970 804 | MEAN S 12960.7 0.0 | | |
|------------------|---------------------------------|-------|--------|-------|-------------|--------------|---------------------------------|------------|--------------------------|-------|-----------|
| (0 | ORREC | TED T | OTAL) | | 6 | 1279 | 5.420 | 992 | | | |
| PA | RAMET | ER | EST | IMATE | | ASYMP | TOTIC | | ASY | MPTOT | IC 95 % |
| | | | | | | STD. | ERROR | | CONFI | DENCE | INTERVAL |
| | | | | | | | | | LOWER | | UPPER |
| A | | | | | | 037396 | | | 3252310953 | | 470464992 |
| В | | | | 03237 | | | | | 1118059675 | | |
| C | | - | | 44641 | | | | | 0186474042 | | 752418773 |
| D | | -0 | 0.0002 | 55165 | 0. | 000348 | 88583 | -0. | 0017563165 | | 012459857 |
| E | | C | .0000 | 98995 | Ο. | 000058 | 81348 | -0. | 0001540618 | 0.0 | 003520517 |
| LOT | ХĽ | XU | YI | R | | AUC | 1 | UCP | DIF | | PCT |
| 1 | 0 | 4 | 4 | 1.000 | 000 | 1.43 | 75 1 | . 441 | 26 -0.003 | 7580 | -0.26142 |
| | 4 | 38 | 34 | 8.500 | | | 86 1 | .128 | 69 -0.000 | 0891 | -0.00789 |
| 3 | 38 | 166 | 128 | 3.76 | 171 | 0.93 | 75 0 | .937 | 46 0.000 | 0407 | 0.00434 |
| 2 3 4 5 | 166 | 310 | 144 | 1.12 | 500 | 0.849 | 90 0 | .849 | 33 -0.000 | 3268 | -0.03850 |
| | 310 | 454 | 144 | 1.000 | 000 | 0.80 | 81 0 | .807 | 19 0.000 | 9061 | 0.11213 |
| 6 | 454 | 598 | 144 | 1.000 | 000 | 0.77 | 95 0 | .780 | 22 -0.000 | 7234 | -0.09281 |
| 7 | 598 | 714 | 116 | 0.809 | 556 | 0.76 | 19 0 | .761 | 72 0.000 | 1826 | 0.02397 |

NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA DF SUM OF SQUARES MEAN SQUARE 5 11938.396467 2387.679293 0 0.000000 0.000000 SOURCE REGRESSION RESIDUAL 5 11938.396467 UNCORRECTED TOTAL (CORRECTED TOTAL) 4 1483,530658 ASYMPTOTIC 95 % FARAMETER ESTIMATE ASYMPTOTIC STD. ERROR CONFIDENCE INTERVAL LOWER 1.298507734 0 1.2985077343 1.2985077343 0 -0.0880122536 -0.0880122536 В -0.088012254 C -1.281533089 0 -1.2815330886 -1.2815330886 D 0.138259272 0 0.1382592715 0.1382592715 -0.038358090 0 -0.0383580897 -0.0383580897 LOT XL XU YI R AUC UΦ DIF PCT 0 79 79 1.00000 0.4383 0.4383 2.08167E-17 4.74941E-15 79 271 192 2.43038 0.3353 0.3353 2.08167E-17 6.20838E-15 271 463 192 1.00000 0.2975 0.2975 -2.08167E-17 -6.99720E-15 4 463 655 192 1.00000 0.2865 0.2865 1.24900E-16 4.35951E-14 5 655 720 65 0.33854 0.2693 0.2693 -2.42861E-16 -9.01824E-14 C.6.4 - Helicopter Programs ----- SYS=HH-52 -----NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA SOURCE DF SUM OF SQUARES MEAN SQUARE REGRESSION 5 3110.9423345 622.1884669 RESIDUAL 1 0.0196905 0.0196905 UNCORRECTED TOTAL 6 3110.9620250 (CORRECTED TOTAL) 5 731.1991835 PARAMETER ESTIMATE ASYMPTOTIC ASYMPTOTIC 95 % STD. ERROR CONFIDENCE INTERVAL LOWER 22.43731843 6.0133639610 -53.968484058 98.843120920 Α

-0.15829848 0.0366975875 -0.624578031

0.38317637 0.0589105435 -0.365340995 1.131693737

0.307981062

В

D

| LOT | XL | XU | YI | R | AUC | UCP | DIF | PCT | | | | |
|--|----------------------------------|-------|--------|---------|----------|--------------------|--------------|----------------|--|--|--|--|
| 1 | 0 | 28 | 28 1 | .00000 | 1.577 | 1.57696 | 0.0000380 | 0.00241 | | | | |
| 2 | | 43 | | .53571 | 1.104 | 1.10305 | 0.0009491 | 0.08597 | | | | |
| | 28 | | | | | | -0.0017007 | | | | | |
| 3 | 43 | 60 | | .13333 | 1.085 | 1.08670 | | | | | | |
| 4 | 60 | 75 | | .88235 | | 1.01015 | 0.0018476 | 0.18257 | | | | |
| 5 | 75 | 87 | | .80000 | | 1.04941 | | | | | | |
| 6 | 87 | 99 | 12 1 | .00000 | 1.055 | 1.04769 | 0.0073097 | 0.69286 | | | | |
| | | | | | - SYS=C | ж-46 | | | | | | |
| NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA | | | | | | | | | | | | |
| SOUR | CE | | | DF | SUM OF | SQUARES | MEAN SQUA | I RE | | | | |
| REGR | ESSI | ON | | 5 | 35854 | 16.34036 | 71709.268 | 307 | | | | |
| RESI | DUAL | | | 3 | 106 | 6.67880 | 355.559 | 960 | | | | |
| | | TED 7 | TOTAL | | | 3.01916 | | | | | | |
| (COR | RECTI | ED TO | OTAL) | 7 | 5776 | 34.44745 | | | | | | |
| PARA | METE | 3 | ESTI | MATE | ASYMPT | OTIC | ASYMP1 | OTIC 95 % | | | | |
| | | | | | STD. E | ERROR . | CONFIDE | INTERVAL | | | | |
| | | | | | | | LOWER | UPPER | | | | |
| A | | 14 | 1 8425 | 3798 4 | 744545 | 2600 -0.3 | 2569773129 2 | | | | | |
| B | | | 0.1091 | | | | 3746363315 | | | | | |
| | | | | | | | | -0.675282435 | | | | |
| C | | | L.2527 | | | | | | | | | |
| D | | | 0.0337 | | | | 2488856842 | | | | | |
| E | | (| 0.0121 | 7687 0 | 0.020247 | 1831 -0.0 | 0522597888 | 0.076613532 | | | | |
| LOT | ᇨ | XU | YI | R | AUC | UCP | DIF | PCT | | | | |
| 1 | 0 | 14 | 1 14 | 1.000 | 00 7.5 | 6.059 | 556 1.48544 | 19.6982 | | | | |
| 2 | 14 | 50 | 36 | 2.571 | .43 3.8 | 98 4.046 | 558 -0.14858 | 3 -3.8116 | | | | |
| 3 | 50 | 110 | 60 | 1.666 | 67 2.7 | 66 2.990 | 020 -0.22420 | -8.1055 | | | | |
| 4 | 110 | 195 | | | | | | 3 -4.1000 | | | | |
| 5 | 195 | 394 | | | | | | | | | | |
| 6 | 394 | 486 | | | | | | | | | | |
| 7 | 486 | 576 | | | | | | | | | | |
| 8 | | | | | | | 396 -0.07696 | | | | | |
| O | 5/6 | 024 | 9 40 | 0.555 | 33 2.5 | 2.02. | 356 -0.07636 | 5 -3.0217 | | | | |
| | | | | | SYS= | :н-53 | | | | | | |
| NON-LIN | EAR I | LEAST | r squa | RES SUM | mary st | TATISTICS | DEPENDEN | T VARIABLE TCA | | | | |
| SOUR | Œ | | | DF | SUM OF | SQUARES | MEAN SQUA | IRE | | | | |
| REGR | ESSI(| ON | | 5 | 61900 | 4.53712 | 123800.907 | 142 | | | | |
| | DUAL | | | | | | 24.742 | 271 | | | | |
| | | TED 7 | TOTAL | 8 | 61907 | 4.22814 8.76526 | · · · | | | | | |
| (COR | (CORRECTED TOTAL) 7 355155.11828 | | | | | | | | | | | |

```
PARAMETER ESTIMATE
                         ASYMPTOTIC
                                          ASYMPTOTIC 95 %
                         STD. ERROR
                                        CONFIDENCE INTERVAL
                                         LOWER
                                                      UPPER
            7.759975405 0.82393298378 5.1378086840 10.382142126
  Α
  В
           -0.156464566 0.02280188809 -0.2290315753 -0.083897558
           -0.987962101 0.01941428568 -1.0497480649 -0.926176137
  C
            0.010328796 0.01088092474 -0.0242997465 0.044957339
  D
           -0.000804402 0.00078785644 -0.0033117550 0.001702951
           ΧU
  LOT
       XL
                ΥI
                       R
                            AUC
                                  UCP
                                            DIF
                                                   PCT
                   1.0000 6.752 6.74302 0.00898 0.1329
   1
       0
           10
                10
       10 141 131 13.1000 4.264 4.26411 -0.00011 -0.0027
   2
                   1.0687 3.762 3.76047 0.00153 0.0408
0.0857 3.382 3.30548 0.07652 2.2625
       141 281 140
   3
       281
           293
   4
                12
              30 2.5000 3.341 3.54013 -0.19913 -5.9601
   5
       293 323
               8 0.2667 3.154 3.23394 -0.07994 -2.5345
   6
       323 331
       331 361 30
361 367 6
                30 3.7500 3.685 3.55546 0.12954 3.5155
   7
                     0.2000 3.947 3.16293 0.78407 19.8650
  DEPENDENT VARIABLE TCA
NON-LINEAR LEAST SQUARES SUMMARY STATISTICS
                    DF SUM OF SQUARES MEAN SQUARE 5 482317.81150 96463.56230 7 3542.72349 506.10336
  SOURCE
  REGRESSION
  RESIDUAL
  UNCORRECTED TOTAL 12 485860.53499
  (CORRECTED TOTAL) 11 132801.70813
                                         ASYMPTOTIC 95 %
  PARAMETER ESTIMATE ASYMPTOTIC
                                        CONFIDENCE INTERVAL
                         STD. ERROR
                                        LOWER UPPER
            15.29996256 4.2031877041 5.3609231930 25.239001931
  A
            -0.04675339 0.0529901281 -0.1720561418 0.078549354
  В
            -1.40145733 0.1211065334 -1.6878310777 -1.115083588
  C
            D
            -0.03226695 0.0202429469 -0.0801342931 0.015600402
  Ε
                                            DIF
                                                    PCT
   LOT
        XL XU
                ΥI
                     R
                            AUC
                                  UCP
        0 18
                18 1.00000 6.181 5.52558 0.6554 10.604
     1
     2
                 24 1.33333 5.226 4.87795 0.3481
                                                 6.660
        18 42
                    1.00000 4.559 4.56248 -0.0035
     3
        42
           66
                24
                                                   -0.076
                    2.50000 3.459 3.27939 0.1796 5.193
        66 126
                60
     5 126 198
                   1.20000 2.760 3.14952 -0.3895 -14.113
                72
                    2.22222 2.307 2.40447 -0.0975
     6
       198 358 160
                                                   -4.225
     7
       358
           442
                84 0.52500 2.313 2.43296 -0.1200
                                                  -5.186
           585 143 1.70238 2.695 2.51476
                                         0.1802
     8
       442
                                                  6.688
     9
       585
           630
                45 0.31469 3.463 2.77722 0.6858 19.803
                 36 0.80000 3.085 3.42923 -0.3442 -11.158
    10 630
           666
       666
           678
                12 0.33333 3.671 4.52391 -0.8529 -23.234
    11
    12 678 690 12 1.00000 3.852 5.06355 -1.2116 -31.453
```

| Α | | 6 | .436 | 049085 | | | 0 | 6.4360490849 | 6.4360490849 |
|-----|----|----|------|---------|-----|-----|---|---------------|---------------|
| В | | -0 | .249 | 974446 | | | 0 | -0.2499744460 | -0.2499744460 |
| С | | -0 | .581 | 005061 | | | | -0.5810050607 | |
| D | | -0 | .116 | 925505 | | | 0 | -0.1169255055 | |
| E | | 0 | .011 | 296887 | | | 0 | 0.0112968875 | 0.0112968875 |
| LOT | ХГ | XU | YI | R | AUC | UCP | | DIF | PCT |
| 1 | 0 | 3 | 3 | 1.00000 | 9.2 | | | 0 | 0 |
| 2 | 3 | 28 | 25 | 8.33333 | 7.1 | 7.1 | | 1.11022E-16 | 1.56369E-15 |

```
28 63 35 1.40000 6.7 6.7 -3.33067E-16 -4.97115E-15
         63 92 29 0.82857 6.6 6.6 5.55112E-16 8.41078E-15
 NON-LINEAR LEAST SQUARES SUMMARY STATISTICS
                                                  DEPENDENT VARIABLE TCA

        SOURCE
        DF
        SUM OF SQUARES
        MEAN SQUARE

        REGRESSION
        5
        72787.516732
        14557.503346

        RESIDUAL
        4
        188.796810
        47.199202

        UNCORRECTED TOTAL
        9
        72976.313542

    (CORRECTED TOTAL) 8 13013.690662
                                                    ASYMPTOTIC 95 %
    PARAMETER ESTIMATE ASYMPTOTIC
                                                 CONFIDENCE INTERVAL
                               STD. ERROR
                                                   LOWER
              4.241110221 1.4873914006 0.1115055240 8.3707149186
    В
              C
              -1.053078893 0.1429321133 -1.4499166900 -0.6562410961
               D
              -0.031686932  0.0221309357  -0.0931314290  0.0297575644
    E
                                                       DIF
     LOT XL XU YI R
                                 AUC UCP
                                                                PCT
          0 20 20 1.00000 3.327 3.31562 0.01138 0.342
      1
           20 69 49 2.45000 2.480 2.49516 -0.01516 -0.611
          69 140 71 1.44898 2.319 2.29672 0.02228 0.961

    140
    185
    45
    0.63380
    1.811
    1.82212
    -0.01112
    -0.614

    185
    221
    36
    0.80000
    1.870
    1.82120
    0.04880
    2.609

    221
    257
    36
    1.00000
    1.589
    1.83972
    -0.25072
    -15.778

      5
          257 287 30 0.83333 1.703 1.73998 -0.03698 -2.171
      7
          287 335 48 1.60000 1.930 1.88854 0.04146 2.148
          335 350 15 0.31250 2.144 1.49183 0.65217
                                                               30.418
C.6.5 - Tactical Armament Programs
```

ERROR: ON OBSERVATION 4, USE OF THE ABOVE PARAMETERS HAS RESULTED IN A DERIVATIVE OR RESIDUAL IN EXCESS OF 1E30. ITERATIONS TERMINATED.

| LOT | XL | χU | YI | R | AUC | UCP | DIF | PCT |
|-----|-------|-------|-------|---------|--------|-----|-----|-----|
| 1 | 0 | 1600 | 1600 | 1.00000 | 0.0275 | | | |
| 2 | 1600 | 4550 | 2950 | 1.84375 | 0.0206 | • | • | |
| 3 | 4550 | 8290 | 3740 | 1.26780 | 0.0189 | | • | |
| 4 | 8290 | 17270 | 8980 | 2.40107 | 0.0162 | | • | |
| 5 | 17270 | 26890 | 9620 | 1.07127 | 0.0147 | • | • | • |
| 6 | 26890 | 41290 | 14400 | 1.49688 | 0.0137 | | | |
| 7 | 41290 | 56890 | 15600 | 1.08333 | 0.0129 | • | • | |

```
8
        56890
                 72490
                         15600
                                 1.00000
                                           0.0123
    9
        72490
                 88090
                         15600
                                 1.00000
                                           0.0118
    10
        88090
                100000
                         11910
                                 0.76346
                                           0.0115
           ----- SYS=CEM ----
ERROR: ON OBSERVATION 3, USE OF THE ABOVE PARAMETERS HAS RESULTED IN A
      DERIVATIVE OR RESIDUAL IN EXCESS OF 1E30. ITERATIONS TERMINATED.
     LOT
              XL
                      ΧU
                             ΥI
                                          AUC
                                                 UCP DIF PCT
                                  R
              0
                     172
                           172 1.00000 0.06924
      1
      2
                           1260
             172
                    1432
                                7.32558
                                        0.03038
      3
            1432
                    7557
                           6125
                                4.86111
                                         0.01988
            7557
                   21777
                          14220
                                         0.01765
                                2.32163
      5
           21777
                   50227
                          28450
                                2.00070
                                         0.01619
           50227
                   85247
                          35020
                                1.23093
                                         0.01401
      7
           85247
                  134157
                         48910
                                1.39663
                                         0.01258
          134157 171666 37509
                               0.76690 0.01181
      ----- SYS=GBU-15 ------
NON-LINEAR LEAST SQUARES SUMMARY STATISTICS
                                              DEPENDENT VARIABLE TCA
   SOURCE
                        DF SUM OF SQUARES
                                           MEAN SQUARE
   REGRESSION
                         5
                              40030.311602
                                              8006.062320
   RESIDUAL
                         4
                                49.974635
                                               12.493659
   UNCORRECTED TOTAL
                         9
                              40080.286237
   (CORRECTED TOTAL)
                         8
                             10225,399632
   PARAMETER
                 ESTIMATE
                            ASYMPTOTIC
                                                 ASYMPTOTIC 95 %
                            STD. ERROR
                                               CONFIDENCE INTERVAL
                                               LOWER
             0.0678323318 0.03726888402 -0.0356412788 0.17130594234
   В
             -.2109658305 0.10548744960 -0.5038419808 0.08191031974
   C
             -.6307718564 0.20302948990 -1.1944644626 -.06707925008
   D
             0.0137175573 0.02084862138 -0.0441667122 0.07160182689
   Ε
             -.0040812309 0.00281998878 -0.0119106690 0.00374820724
 LOT
        \chi L
             ΧU
                  ΥI
                        R
                               AUC
                                        UCP
                                                              PCT
        0
  1
             40
                   40
                      1.00000
                               0.1975 0.159707
                                                 0.037793
                                                            19.136
  2
        40
             105
                  65
                      1.62500
                               0.2000
                                       0.135899
                                                0.064101
                                                             32.051
  3
             445
       105
                      5.23077
                                                -0.000204
                  340
                               0.1439
                                       0.144104
                                                            -0.142
       445
             695
                 250
                      0.73529
                               0.1483
                                       0.142964
                                                 0.005336
                                                             3.598
  5
                 320
       695
           1015
                      1.28000 0.1308
                                      0.146472
                                                -0.015672
                                                           -11.982
      1015
           1615
                 600
                      1.87500 0.1718 0.170528
                                                0.001272
                                                            0.740
           2215 600 1.00000 0.1539 0.155601
  7
      1615
                                                -0.001701
                                                            -1.105
  8
      2215
                 600 1.00000 9.1483 0.146841
           2815
                                                0.001459
                                                             0.984
      2815 3415 600 1.00000
                               1420 0.140330
```

0.001670

1.176

C.6.6 - Tactical Missile Programs

| | SYS=AMRAAM | |
|--------------------------|--|---|
| NON-LINEAR LEAST SQUARES | SUMMARY STATISTICS | DEPENDENT VARIABLE TCA |
| SOURCE | DF SUM OF SQUARES | MEAN SQUARE |
| RECRESSION | 5 3265482.7960 5 1362.0730 10 3266844.8690 | 653096.5592 |
| RESIDUAL | 5 1362.0730 | 272.4146 |
| UNCORRECTED TOTAL | 10 3266844.8690 | |
| (CORRECTED TOTAL) | 9 183807.0285 | |
| PARAMETER ESTIMAT | E ASYMPTOTIC | ASYMPTOTIC 95 % |
| | STD. ERROR | CONFIDENCE INTERVAL |
| | | LOWER UPPER |
| | 9 1.4239470778 1.200 | |
| | 4 0.0293595433 -0.428 | |
| | 4 0.0732795904 - 1 <i>.</i> 171 | |
| | 0 0.0100972726 -0.034 | |
| | 9 0.0014695677 -0.002 | |
| LOT XL XU YI | | DIF PCT |
| | 1.00000 1.233 1.23273 | |
| | 5.44845 0.512 0.51211 | |
| | 1.85809 0.342 0.33830 | |
| | 1.52546 0.257 0.26154 | |
| | 0.96796 0.232 0.22453 | |
| | 1.00000 0.194 0.19986 | |
| | 1.00000 0.182 0.18334 | |
| | 1.03448 0.170 0.17067 | |
| | 1.00000 0.158 0.16107 | |
| 10 20911 24674 3763 | 1.25433 0.155 0.15070 | 0.0042960 2.7716 |
| | SYS=HARM | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ |
| | | |
| NON-LINEAR LEAST SQUARES | SUMMARY STATISTICS | DEPENDENT VARIABLE TCA |
| SOURCE | DF SUM OF SQUARES | MEAN SQUARE |
| RECRESSION | 5 1585799.5841 6 241.1342 | 317159.9168 |
| RESIDUAL | 6 241.1342 | 40.1890 |
| UNCORRECTED TOTAL | 11 1586040.7184 | |
| (CORRECTED TOTAL) | 10 338342.8883 | |
| PARAMETER ESTIMAT | E ASYMPTOTIC | ASYMPTOTIC 95 % |
| | STD. ERROR | CONFIDENCE INTERVAL |
| | | LOWER UPPER |
| | 5 0.23253976870 1.733 | |
| | 7 0.01727732160 -0.212 | |
| | 5 0.03305171946 -1.199 | 7501080 -1.0380007031 |
| D 0.00351107 | 3 0.00885977190 -0.018 | 1680236 0.0251901694 |
| E -0.001774829 | 9 0.00237377979 -0.007 | 5832636 0.0040336046 |

```
XL XU YI R AUC UCP
                                                  PCT
LOT
                                           DIF
               80 1.00000 0.809 0.787214 0.021786 2.6929
      0
          80
     80 316 236 2.95000 0.517 0.481427 0.035573 6.8806
    316 712 396 1.67797 0.400 0.394460 0.005540 1.3850
     712 1399 687 1.73485 0.314 0.326171 -0.012171 -3.8761
   1399 3144 1745 2.54003 0.249 0.250566 -0.001566 -0.6288
   3144 5612 2468 1.41433 0.223 0.221012 0.001988 0.8914
    5612 7731 2119 0.85859 0.208 0.209496 -0.001496 -0.7192
   7731 9863 2132 1.00613 0.197 0.199684 -0.002684 -1.3622
 9 9863 12863 3000 1.40713 0.184 0.183227 0.000773 0.4203
10 12863 15863 3000 1.00000 0.177 0.176455 0.000545 0.3082
 11 15863 16961 1098 0.36600 0.196 0.193046 0.002954 1.5072
```

----- SYS=IIR -----

NOTE: THE RESIDUAL SS HAS FAILED TO CONVERGE IN THE SPECIFIED NUMBER OF ITERATIONS.

| LOT | ХГ | VU | YI | R | AUC | UCP | DIF | PCT |
|-----|-------|-------|-------|---------|-------|-----|-----|-----|
| 1 | 0 | 200 | 200 | 1.00000 | 0.309 | • | • | |
| 2 | 200 | 1100 | 900 | 4.50000 | 0.135 | • | | |
| 3 | 1100 | 3700 | 2600 | 2.88889 | 0.083 | • | | |
| 4 | 3700 | 9429 | 5729 | 2.20346 | 0.082 | • | • | |
| 5 | 9429 | 18429 | 9000 | 1.57095 | 0.062 | | | • |
| 6 | 18429 | 30429 | 12000 | 1.33333 | 0.057 | • | | |
| 7 | 30429 | 42429 | 12000 | 1.00000 | 0.055 | • | | • |
| 8 | 42429 | 54429 | 12000 | 1.00000 | 0.053 | • | • | |
| 9 | 54429 | 60664 | 6235 | 0.51958 | 0.057 | • | • | |
| | | | | | | | | |

NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA

| SOURCE | DF : | SUM OF SQUARES | MEAN SQUARE |
|------------|------|----------------|-------------|
| REGRESSION | 5 | 115060.49536 | 23012.09907 |
| RESIDUAL | 3 | 91.08954 | 30.36318 |
| | _ | | |

UNCORRECTED TOTAL 8 115151.58490

(CORRECTED TOTAL) 7 6543.29279

| PARAMETER | ESTIMATE | ASYMPTOTIC | asyn | PTOTIC 95 % |
|-----------|--------------|--------------|---------------|----------------|
| | | STD. ERROR | CONFI | DENCE INTERVAL |
| | | | LOWER | UPPER |
| A | 4.332650684 | 1.4175614097 | -0.1787385022 | 8.8440398705 |
| В | -0.327106257 | 0.0509162339 | -0.4891471709 | -0.1650653422 |
| C | -1.141041591 | 0.1171114860 | -1.5137488952 | -0.7683342867 |
| D | 0.014054213 | 0.0311735390 | -0.0851555747 | 0.1132640013 |
| E | -0.006925074 | 0.0083058004 | -0.0333582841 | 0.0195081357 |

| | LOT | ХГ | ΧŪ | ΥI | R | AUC | OCD. | DIF | PCT | |
|---|---------------------------------|--|---|---|---|--|--|---|--|---|
| | 1 2 3 4 5 6 7 | 0 100 325 925 1725 2825 4225 | 100 325 925 1725 2825 4225 5125 | 100 225 600 800 1100 1400 900 | 1.00000 2.25000 2.66667 1.33333 1.37500 1.27273 0.64286 | 0.741 0.378 0.199 0.169 0.134 0.116 | 0.770494 0.351117 0.202110 0.168897 0.135061 0.113491 0.109195 | -0.029494 0.026883 -0.003110 0.000103 -0.001061 0.002509 0.001805 | 7.1118 -1.5627 0.0612 -0.7918 2.1630 | |
| | 8 | 5125 | 6269 | 1144 | 1.27111 | 0.095 | 0.099455 | -0.004455 | | |
| | | | | | a | | | | | |
| ٠ | | | | | SYS | =AIM7F- | GD | | | |
| | NON-L | INEAR | LEAST | SQUARE | s summary | STATIS | TICS I | DEPENDENT V | ARIABLE TO | Ά |
| | SO | URCE | | | DF SUM | OF SQUA | RES MI | ean square | | |
| | | GRESSI | ON | | | 537.684 | | 707.536921 | | |
| | RE | SIDUAL | | | 1 | 83.473 | 421 | 83.473421 | | |
| | UN | CORREC | TED TO | TAL | 6 28 | 621.158 | 025 | | | |
| | (0 | ORRECT | ED TOT | AL) | 5 7 | 732.207 | 921 | | | |
| | | | _ | | | | | | - 05 0 | |
| | PAI | RAMETE | к . | estima? | | MPTOTIC | | ASYMPTOTI | | |
| | | | | | STD | . ERROR | | CONFIDENCE | | |
| | | | 2.2 | 3656283 | 22 1 020 | 6485548 | | LOWER | UPPER 69723369 | |
| | A | | | 363626. 108614 | | 6420698 | | 41618 3.8° | | |
| | B C | | | 006271 | | 5992835 | | 51664 5.8 | | |
| | D | | | 1177259 | | 9908226 | | | 73064793 | |
| | E | | | 0201103 | | 4550528 | -0.25789 | | 51912939 | |
| | ŭ | | 0.0 | 020110. | 0.020 | 4550520 | 0.25703 | 70003 0.20 | 71712737 | |
| | LOT | ХL | υx | ΥI | R | AUC | UCP | DIF | PCT | |
| | 1 | 0 | 15 | 15 | 1.00000 | 1.551 | 1.21319 | 0.337811 | 21.780 | |
| | 2 | 15 | 85 | 70 | 4.66667 | 0.379 | 0.45237 | -0.073366 | -19.358 | |
| | 3 | 85 | 295 | 210 | 3.00000 | 0.228 | 0.24345 | -0.015454 | -6.778 | |
| | | ~~~ | | | | | | | | |

C.7 - Modified Alternative Two Non-linear Regression

1255 2565 1310 1.74667 0.090 0.09115

505

210

750

295

505 1255

This section contains the summary results produced by the non-linear regression procedure in SAS. The SAS program used to produce this run was discussed in Appendix B.7.

1.00000 0.195

3.57143 0.130 0.12562

6.825

3.372

-1.279

0.013308

0.004383

-0.001151

0.18169

C.7.1 - Bomber Aircraft Programs

| SYS=B-1B | | | | | | | | |
|---|--|--|--|--|--|--|--|--|
| | | DEPENDENT VARIABLE TCA | | | | | | |
| SOURCE RECRESSION RESIDUAL UNCORRECTED TOTAL | DF SUM OF SQUARES 5 59477976.810 0 0.000 5 59477976.810 | MEAN SQUARE 11895595.362 0.000 | | | | | | |
| (CORRECTED TOTAL) | 4 17234615.032 | | | | | | | |
| PARAMETER ESTIMATE | | ASYMPTOTIC 95 % CONFIDENCE INTERVAL LOWER UPPER | | | | | | |
| A 391.4722477 B -0.2627886 C -0.0067588 D -0.0001379 E 0.0003286 F -0.0000183 | 0 -0 3 0 -0 9 0 -0 5 0 0 | .47224774 391.47224774 .26278796 -0.26278796 .00675882 -0.00675882 .00013791 -0.00013791 .00032864 0.00032864 .00001827 -0.00001827 | | | | | | |
| LOT XL XU R | AUC UCP | DIF PCT | | | | | | |
| 1 0 1 1.00000 2 1 8 6.00000 3 8 18 0.42857 4 18 52 2.40000 5 52 100 0.41176 | 260.3 260.3 7.1 200.5 200.5 3.5 142.0 142.0 -7.1 111.3 111.3 -1.7 | 0543E-15 | | | | | | |
| | SYS=B-52 | | | | | | | |
| SOURCE | DF SUM OF SQUARES 6 70513165.164 4 1887606.746 | DEPENDENT VARIABLE TCA MEAN SQUARE 11752194.194 471901.687 | | | | | | |
| (CORRECTED TOTAL) | 9 18070289.989 | | | | | | | |
| PARAMETER ESTIMATE | E ASYMPTOTIC STD. ERROR | ASYMPTOTIC 95 % CONFIDENCE INTERVAL LOWER UPPER | | | | | | |
| A 107.2953890 B -0.1422280 C -0.0214379 D 0.0040693 E -0.0016023 F 0.0000062 | 0.165700874 -0.0 0.051481838 -0.0 0.030871934 -0.0 0.001591992 -0.0 | 717375570 286.30815366 602281150 0.31782516 164372441 0.12149669 081643812 0.08978233 006022368 0.00281767 000009913 0.00002227 | | | | | | |

|] | LOT |) | Œ | ΧU | | R | A | UC | | UCP | | D | IF | E | CT |
|-------|----------|--------|---------|---------------|--------|---------------|-------|----------------|---------|----------|--------|------|---------|-----------------|---------|
| | 1 | (|) | 20 | 1.00 | 0000 | 11 | 2.5 | 75 | .081 | 5 : | 37.4 | 18 | 33.2 | 261 |
| | 2 | 20 | | 63 | 1.15 | | | 7.0 | | .082 | | 11.0 | | -29.9 | |
| | 3 | 63 | | 88 | -0.41 | | | 8.6 | | .771 | | 23.1 | | -81.0 | |
| | 4 | 88 | | 165 | 2.08 | | | 2.3 | | .241 | | 1.0 | | 3.2 | |
| | 5 | 165 | | 298 | 0.72 | | | 3.4 | | .237 | | -2.8 | | -12.1 | |
| | 6 | 298 | | 500 | 0.51 | | | 8.4 | | .151 | | 0.2 | | 0.8 | |
| | 7 | 500 | | 601 | -0.50 | | | 7.3 | | .248 | | 2.0 | | 7.5 | |
| | 8 | 601 | | 640 | -0.61 | | | 7.3 | | .584 | | -6.2 | | -23.0 | |
| | 9 | 640 | | 702 | 0.58 | | | 5.4 | | .162 | | 11.2 | | 31.7 | |
| | 10 | 702 | | 742 | -0.35 | | | 5.0 | | .065 | | 3.9 | | 11.2 | |
| • | 10 | 702 | • | 172 | 0.5 | 7404 | 3 | 2.0 | 21 | 005 | _ | J.J. | 3.7 | 11.2 | 747 |
| | SYS=B-58 | | | | | | | | | | | | | | |
| NON- | -LIN | EAR | LEA | ST SQ | UARES | SUMM | IARY | STATI | STI | CS | DE | END | ENT | VARIAE | BLE TCA |
| , | or m | CHT. | | | | DE 0 | ID O | יים מסו | IADE | | MEAN | | מורו גו | 1 | |
| | SOUR | | · ONT | | | | | F SQU 38328 | | | | 582 | | | |
| | REGRI | | | | | 4 0 | | | 0.00 | | 3553 | | | | |
| | | | | TOTA | r | 4 | | 38328 | | | | Ų | .000 | | |
| , | | rires. | . I EIJ | IOIA | ь | * | 142 | 20220 | . 0 / | 7 | | | | | |
| (| (CORI | RECT | ED | TOTAL |) | 3 | 18 | 30393 | 3.07 | 4 | | | | | |
| I | PARA | METE | ir. | ES' | TIMATE | ; | ASYM | PTOTI | C | | P | SYME | TOT | IC 95 | % |
| | | | | | | | STD. | ERRO |)R | | | | | INTER | |
| | | | | | | | | | | | LOV | ÆR | | UE | PER |
| 2 | A | | | 22.83 | 529489 | ı | | | 0 | 22.8 | 352948 | 889 | 22. | 835294 | 1889 |
| | 3 | | | | 851176 | | | | 0 | 0.4 | 285117 | 757 | 0. | 428511 | 757 |
| | 2 | | | | 887566 | | | | 0 | 0.0 | 188756 | | | 018875 | |
| |) | | | | 288351 | | | | 0 | | 028835 | | | 402883 | |
| | 3 | | | | 387371 | | | | | | 038737 | | | 003873 | |
| I | | | | | 035249 | | | | | | 003524 | | | 000352 | |
| | | | | | | | | | | | | | | | |
| L | TC T | ΧĽ | XU | | R | AUC | | UCEP | | | DIF | • | | PC | T |
| 1 | l | 0 | 17 | 1. | 00000 | 93. | 86 9 | 93.86 | 5 | 1.77 | 636E-1 | .5 | 1.8 | 9256E~ | ·15 |
| 2 | 2 : | 17 | 53 | 1. | 11765 | 80. | 26 | 80.26 | ; - | 3.55 | 271E-1 | .5 - | -4.4 | 2651E- | ·15 |
| | | 53 | 73 | -0. | 44444 | 73. | | 73.16 | | | 636E-1 | | 2.4 | 280 4E ~ | -15 |
| 4 | • | 73 | 103 | 0. | 50000 | 36. | 56 | 36.56 | ; - | 5.32 | 907E-1 | .5 - | -1.4 | 5762E- | -14 |
| | | | | | | | | | | | | | | | |
| C.7.2 | 2 - 1 | Fiah | ter | Airc | raft P | rogr | ams | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | SYS | S=A-1 | .0 | | | | | | |
| NON- | LINE | EAR | LEA: | ST SQ | JARES | SUMM | ARY S | TATI | STI | CS | DEP | ENDE | TY | VARIAB | LE TCA |
| | | ·*· | | | | DD 6 | . D | 7 60. | ,,,,,,, | a | 1000 | | | | |
| | OUR | | o., | | | | | | | | MEAN | | | | |
| | EGRE | | | | | | | | | | 8630 | | | | |
| | ESII | | | m e=== | | 3 | | 3685. | | | 28 | 95.1 | .179 | | |
| Ĺ | INCOF | REC | TED | TOTAL | _ | 9 | 518 | /217. | 384 | 4 | | | | | |

| CORRECTED | TOTAL 1 | R | 122666 | 6.3049 |
|-----------|---------|---|--------|--------|
| CURRECTED | TUTALI | 0 | 122000 | 0.3047 |

| PARAM | ETER | EST | 'IMATE | | ASYMPTOTIC STD. ERROR | | | | IC 95 % INTERVAL UPPER | |
|---------------|------|---------|--------|-----|--------------------------|----------|-------|-----|------------------------------|--|
| A | | 8.9928 | 47757 | 3.9 | 9901148671 | -3.70569 | | 21. | 691388322 | |
| В | | 0.0649 | | | 1214881237 | · - | | | 451572925 | |
| ċ | | -0.0043 | | 0.0 | 0311506591 | -0.10348 | 06462 | 0. | 094793299 | |
| D | | 0.0004 | | | 0073700082 | | | 0. | 023902716 | |
| Ē | | -0.0009 | | | 0014071986 | | | 0. | 003485556 | |
| F | | 0.0000 | | | 0000071008 | | | 0. | 000025181 | |
| _ | | | | | | | | | | |
| LOT | ХL | ΧU | | R | AUC | UCE | D | IF | PCT | |
| 1 | 0 | 22 | 1.00 | 000 | 12.37 | 9.7943 | 2.5 | 757 | 20.822 | |
| 2 | 22 | 75 | 1.409 | 909 | 9.16 | 9.5001 | -0.3 | 401 | -3.713 | |
| 3 | 75 | 95 | -0,62 | 264 | 8.20 | 11.1783 | -2.9 | 783 | -36.320 | |
| | 95 | 195 | 4.00 | 000 | 8.20 | 8.1955 | 0.0 | 045 | 0.055 | |
| 4 5 | 195 | 339 | 0.44 | 000 | 7.82 | 7.7661 | 0.0 | 539 | 0.689 | |
| 6 | 339 | 483 | 0.000 | 000 | 7.59 | 7.7617 | -0.1 | 717 | -2.262 | |
| 7 | 483 | 627 | 0.000 | 000 | 7.82 | 7.7044 | 0.1 | 156 | 1.479 | |
| 8 | 627 | 687 | -0.58 | 333 | 10.18 | 10.0641 | 0.1 | 159 | 1.138 | |
| 9 | 687 | 707 | -0.66 | 567 | 13.64 | 12.4110 | 1.2 | 290 | 9.011 | |
| | | | | | SYS=F-100 | | | | | |

ERROR: ON OBSERVATION 2, USE OF THE ABOVE PARAMETERS HAS RESULTED IN A DERIVATIVE OR RESIDUAL IN EXCESS OF 1E30. ITERATIONS TERMINATED.

| LOT | ХL | νυ | R | AUC | UCP | DIF | PCT |
|-----|------|------|---------|------|-----|-----|-----|
| 1 | 0 | 23 | 1.0000 | 6.51 | • | • | |
| 2 | 23 | 568 | 22.6957 | 3.45 | | • | |
| 3 | 568 | 1161 | 0.0881 | 3.08 | • | • | • |
| 4 | 1161 | 1720 | -0.0573 | 3.10 | | • | |
| 5 | 1720 | 2277 | -0.0036 | 2.50 | • | • | • |

------ SYS=F-101 ------

| NON-LINEAR LEAST SQUARES | SU | MMARY STATIST | ics depend | ENT VARIABLE TCA |
|--------------------------|----|---------------|--------------|------------------|
| SOURCE | _ | SUM OF SQUAR | ·- | |
| REGRESSION | 6 | 7076859.84 | 46 1179476. | 6408 |
| RESIDUAL | 0 | 0.00 | 00 0. | 0000 |
| UNCORRECTED TOTAL | 6 | 7076859.84 | 46 | |
| / | _ | 222222 | | |
| (CORRECTED TOTAL) | 5 | 2200718.46 | 43 | |
| PARAMETER ESTIMAT | 7 | ASYMPTOTIC | ASVM | PTOTIC 95 % |
| TACHETEK BOTTIET | • | STD. ERROR | | ENCE INTERVAL |
| | | | LOWER | UPPER |
| A 26.6406438 | 4 | 0 | 26.640643837 | 26.640643837 |
| B -0.1262176 | 8 | 0 | -0.126217679 | -0.126217679 |

```
0 0.003341678 0.003341678
             0.00334168
   C
                                0 -0.022316955 -0.022316955
   D
            -0.02231696
   E
            -0.00188568
                                 0 -0.001885675 -0.001885675
   F
             0.00000645
                                 0 0.000006447
                                              0.000006447
 LOT
      XL
         XU
                   R
                      AUC
                            UCP
                                         DIF
                                                     PCT
               1.00000 16.85 16.85 -8.88178E-16 -5.27109E-15
      0
         31
  1
                      7.58 7.58 1.11022E-15 1.46467E-14
  2
      31 115
              1.70968
                                             6.42676E-15
     115
         424
              2.67857
                      6.91
                            6.91
                                  4.44089E-16
  3
         630
                      5.76 5.76
                                             1.92747E-14
     424
              -0.33333
                                   1.11022E-15
  5
     630
         714
              -0.59223
                      5.27 5.27 -4.44089E-16 -8.42674E-15
     714 807
               0.10714
                      5.22
                             5.22 -2.22045E-15 -4.25373E-14
  ERROR: ON OBSERVATION 3, USE OF THE ABOVE PARAMETERS HAS RESULTED IN A
     DERIVATIVE OR RESIDUAL IN EXCESS OF 1E30. ITERATIONS TERMINATED.
                 ΧU
                                AUC UCP DIF PCT
     LOT
            XL
                            R
                 37
      1
            0
                        1.00000
                                11.66
      2
            37
                 145
                                 5.17
                       1.91892
               707
      3
           145
                       4.20370
                                  3.50
                 847
           707
                      -0.75089
                                  2.21
     NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA
                     DF SUM OF SQUARES
   SOURCE
                                       MEAN SQUARE
                     4 4765078.8733
   REGRESSION
                                       1191269.7183
   RESIDUAL
                      0
                          0.0000
                                           0.0000
   UNCORRECTED TOTAL
                     4 4765078.8733
                  3 480903.3427
   (CORRECTED TOTAL)
   PARAMETER
             ESTIMATE
                         ASYMPTOTIC
                                         ASYMPTOTIC 95 %
                         STD. ERROR
                                         CONFIDENCE INTERVAL
                                         LOWER
            41.92637550
                                0 41.926375495 41.926375495
   A
   В
             0.08339599
                                0 0.083395993
                                              0.083395993
   C
             0.09504415
                                0 0.095044148 0.095044148
   D
             0.02604880
                                0 0.026048798
                                              0.026048798
                               0 -0.007225944 -0.007225944
   Е
            -0.00722594
   F
             0.00001326
                               0 0.000013260 0.000013260
 LOT
     ХL
         XU
                   R AUC
                            UCP
                                         DIF
                                                    PCT
              1.00000 34.19 34.19 8.88178E-16
  1
      0
         42
                                             2.59777E-15
  2
             1.09524 10.54 10.54 4.44089E-16 4.21337E-15
      42 130
  3
     130 175
             -0.48864 11.64 11.64 -1.55431E-15 -1.33532E-14
     175
         340
              2.66667 7.59 7.59
                                           0
```

| | | | | | | | | | ENT VARIABLE TCA |
|-------|----------|---------------|------------|----|-------|--------------|------------|-------------|---|
| sc | N IRCTE | | TOTAL | DF | SIM C | DE SOLIA | RES | MEAN SQ | HARE |
| ਜ਼ਰ | Y STREET | TON | | 6 | 102 | 247642 | 059 | 1707940 | |
| DE | KINTP | T. | | n | 102 | .47042. A | 000 | 0.56701 | .000 |
| IN | | יויביור. ב | ጥረንሞእ፣ | 6 | 102 | 247642 | 050 050 | Ū | .000 |
| OI | COLUM | | TOTAL | U | 102 | .37032. | 037 | | |
| (C | ORREC | TED I | OTAL) | 5 | | | | | |
| PA | RAMET | ER | ESTIMATE | | ASYM | PTOTIC | | ASYM | PTOTIC 95 % ENCE INTERVAL |
| - | | | | | STD. | ERROR | | CONFID | ENCE INTERVAL |
| | | | | | | | | T OUTER | ा ताराच्या |
| A | | 3 | 4.73564275 | ; | | 0 | 34 | .735642753 | 34.735642753 -0.111179246 0.005737609 |
| В | | | 0.11117925 | | | ŏ | -0 | .111179246 | -0.111179246 |
| Č | | | 0.00573761 | | | ň | Õ | 005737609 | 0.005737609 |
| D | | | 0.00126181 | | | ň | -0 | 001261809 | -0.001261809 |
| E | | | 0.00104248 | | | ก | -0 | 001201003 | -0.001042484 |
| F | | | 0.00000768 | | | n | 0 | 000042404 | 0.00007681 |
| r | | | 0.00000700 | , | | U | Ų. | .000007661 | 0.000007001 |
| LOT | ХL | ΧU | R | ΑU | r | UCEP | | חזה | PCT |
| 1 | | | | | | 25 50 | 7 1 | 1 22227E_15 | 5.20478E-15 |
| | 30 | | 1.06667 | | | | | | -4.54172E-15 |
| | | | | | | | | | |
| | | | 0.16129 | | .183 | | | | 2.58447E-15 |
| | 164 | | 0.50000 | | | | | | 1.81515E-14 |
| 5 | 272 | | -0.77778 | | | | | | 1.08105E-13 |
| 6 | 296 | 404 | 3.50000 | 16 | .272 | 16.27 | 2 -1 | L.77636E-15 | -1.09166E-14 |
| | | | | | - SYS | :=F-15€1 | n | | |
| | | | | | 010 | -r 13G | | | |
| NON-L | INEAR | LEAS | | | | STATIST | rics | DEPENDE | INT VARIABLE TCA |
| SO | URCE | | | DF | SUM O | F SQUAR | RES | MEAN SQU | JARE |
| | GRESS: | | | 6 | 841 | 8404.28 | 369 | 1403067.3 | 8811 |
| RE | SIDUA | L | | 2 | | 444.8 | 593 | 222.4 | 1297 |
| UN | CORREX | CTED | TOTAL | 8 | 841 | 8849.1 | 462 | | |
| | | | | | | | | | |
| (C | ORREC. | red t | OTAL) | 7 | 75 | 2208.09 | 946 | | |
| PAI | RAMETT | ⊒ ₹ | ESTIMATE | | ASYM | PTOTIC | | ASYME | TOTIC 95 % |
| | | | | | STD. | ERROR | | CONFIDE | NCE INTERVAL |
| | | | | | | | | LOWER | UPPER |
| A | | 0. | 9801180073 | 0. | 51809 | 237116 | -1.2 | 490780381 | 3.2093140527 |
| В | | | | | | | | 641444029 | 1.1737892536 |
| C | | | | | | | | | 0.0482132910 |
| D | | | 1002200911 | | | | | | 0.2172074807 |
| Ē | | | | | | | | | 0.0041270468 |
| F | | 0.0 | 0000803205 | 0. | 00001 | | | 000328113 | 0.0001278298 |
| - | | | | | | | ٠.٠ | | |

| LOT | ХГ | χU | | R | AUC | UCP | DIF | PCT |
|---------|---------------|---------|---------|-----|------------|----------|-------------|--------------|
| 1 | 0 | 97 | 1.000 | 000 | 17.249 | 17.2449 | 0.00408 | 0.0236 |
| 2 | 97 | 175 | -0.195 | 88 | 15.588 | 15.6287 | -0.04066 | -0.2609 |
| 2 3 | 175 | 235 | -0.230 | 77 | 15.508 | 15.3527 | 0.15534 | 1.0017 |
| 4 | 235 | 277 | -0.300 | 000 | 17.665 | 17.9630 | -0.29802 | -1.6871 |
| 5 | 277 | 313 | -0.142 | 286 | 19.943 | 19.6627 | 0.28034 | 1.4057 |
| 6 | 313 | 352 | 0.083 | 333 | 19.308 | 19.5181 | -0.21006 | -1.0880 |
| 7 | 352 | 388 | -0.076 | 92 | 21.954 | 21.8241 | 0.12989 | 0.5917 |
| 8 | 388 | 436 | 0.333 | 333 | 21.017 | 21.0277 | -0.01071 | -0.0510 |
| | | | | | | | | |
| | | | | | - SYS=F-15 | E | | |
| | | | | | | | | |
| NON-LIN | IEAR LE | EAST SC | UARES S | MMU | ARY STATIS | TICS | DEPENDENT V | VARIABLE TCA |
| | | | | | | | | |
| SOUF | | | | | UM OF SQUA | | TEAN SQUARE | |
| | ESSION | Ī | | 5 | 14025321. | | 2805064.202 | |
| RESI | DUAL | | | 1 | 7455. | | 7455.525 | |
| UNCC | RRECTE | D TOTA | L | 6 | 14032776. | 537 | | |
| | | | | | | | | |
| (COF | RECTE | TOTAL | (۱) | 5 | 172346. | 387 | | |
| | | | | | | | | |
| PARA | METER | ES | TIMATE | | ASYMPTOTIC | | ASYMPTOT | |
| | | | | | STD. ERROR | ı • | CONFIDENCE | INTERVAL |
| | | | | | | | LOWER | UPPER |
| A | | | 385832 | 4. | 6193468078 | -53.2840 | 34708 64.1 | .02806372 |
| В | | | 377166 | 0. | 0000000000 | | | 323377166 |
| C | | | 097860 | | 0712591021 | | 20292 1.0 | 05516011 |
| D | | 0.027 | 360355 | 0. | 0586383625 | -0.7176 | 98679 0.7 | 72419389 |
| E | | 0.000 | 469879 | 0. | 0053297742 | -0.0672 | 50232 0.0 | 68189990 |
| F | | -0.000 | 019228 | 0. | 0000401219 | -0.0005 | 29018 0.0 | 000490561 |

------ SYS=F-16AB ------

AUC

20.544

19.203

17.608

16.175

16.041

17.927

UCP

20.5440

19.2030

17.6080

15.8377

16.7743

17.5301

DIF

-0.00000

-0.00000

0.00000

0.33726

-0.73326

0.39695

PCT

-0.0000

-0.0000

0.0000

2.0850

-4.5712

ΧU

60

132

228

324

420

516

R

1.00000

0.20000

0.33333

0.00000

0.00000

0.00000

XL

0

60

132

228

324

420

LOT

1 2

3

4

5

NOTE: THE RESIDUAL SS HAS FAILED TO CONVERGE IN THE SPECIFIED NUMBER OF ITERATIONS.

| LOT | ХL | VU | R | AUC | UCP | DIF | PCT |
|-----|-----|-----|----------|-------|-----|-----|-----|
| 1 | 0 | 105 | 1.00000 | 10.14 | • | • | • |
| 2 | 105 | 250 | 0.38095 | 7.74 | • | | |
| 3 | 250 | 425 | 0.20690 | 8.04 | • | • | |
| 4 | 425 | 605 | 0.02857 | 5.05 | | | • |
| 5 | 605 | 725 | -0.33333 | 5.13 | | | |

| | | | | SY | S=F−1£I | · | | |
|----------------|----------|------------|--------------------|-----------|---------|----------------|------------|-----------------------------|
| | | | | | | | | |
| NON-LIN | NEAR L | EAST S | QUARES | SUMMARY | STATIS | STICS | DEPEND | ENT VARIABLE TCA |
| SOUR | CE | | 1 | DF SUM | OF SQUE | RES | MEAN SQ | UARE |
| | ESSIO | N | | | 016685. | | 8002780 | |
| | DUAL | | | 4 | 159. | | 39 | .949 |
| UNCC | RRECT | ED TOTA | AL . | 10 48 | 016845. | 623 | | |
| (COF | RECTE | D TOTAL | 7) | 9 1 | 747028. | 765 | | |
| PARA | METER | ES | TIMATE | ASY | MPTOTIC | | ASYM | PTOTIC 95 % |
| | | | | STD | . ERROF | } | CONFID | ENCE INTERVAL |
| | | | | | | | LOWER | UPPER |
| A | | | L030848 | | | | .306950060 | 19.913666907 |
| В | | | 3353785 | | | | .499488061 | -4.167587633 |
| C D | | | 5506958 0093864 | | | | | -0.154438234 0.422992724 |
| E | | | 1896582 | | | | | 0.050807816 |
| F | | | 013544 | | | | .000140495 | -0.000130391 |
| | vor | . | _ | 211 | _ | | 215 | Do courts |
| LOT | ХL | XU | R 1 0000 | UA O | | UCP | DIF | PCT |
| 1 2 | 0 120 | 120 264 | 1.0000 | | | 8600 5800 | 0.000000 | 0.00000 0.00000 |
| 3 | 264 | 414 | 0.0416 | | | 5500 | -0.000000 | -0.00000 |
| 4 | 414 | 630 | 0.4400 | | | 9300 | -0.000000 | -0.00000 |
| 5 | 630 | 846 | 0.0000 | | | 2594 | 0.020612 | 0.18273 |
| 6 | 846 | 1062 | 0.0000 | | | 0401 | -0.020138 | -0.18274 |
| 7 | 1062 | 1278 | 0.0000 | 0 10.8 | | 8693 | 0.010734 | 0.09866 |
| 8 | 1278 | 1494 | 0.0000 | 0 10.6 | | 7296 | -0.039603 | -0.37047 |
| 9 | 1494 | 1710 | 0.0000 | | | 6117 | -0.001715 | -0.01616 |
| 10 | 1710 | 1926 | 0.0000 | 00 10.9 | 54 10. | 5099 | 0.030134 | 0.28590 |
| | | | | | | | | |
| <u>C.7.3</u> - | Electr | onics | Program | <u>15</u> | | | | |
| | | | | SYS= | ARC-10 | 9 v - - | | |
| NON-LIN | EAR LE | east so | uares s | UMMARY | STATIS | TICS | DEPENDE | ENT VARIABLE TCA |
| SOUR | Œ | | D | | | | MEAN SQL | |
| | ESSION | I | | 5 66. | 744073 | 730 | 13.34881 | 1746 |
| RESI | | | | | 000000 | | 0.00000 | 0000 |
| UNCO | RRECTE | D TOTA | L | 5 66. | 744073 | 730 | | |
| (COR | RECTED | TOTAL |) | 4 29. | 010182 | 832 | | |

| (CORRECTE | D TOTAL) | 4 | 29.010182 | 332 | |
|-----------|--------------|---|------------|---------------|----------------|
| PARAMETER | ESTIMATE | | ASYMPTOTIC | ASYI | MPTOTIC 95 % |
| | | | STD. ERROR | CONFI | DENCE INTERVAL |
| | | | | LOWER | UPPER |
| A | 0.0508125509 | | 0 | 0.05081255088 | 0.05081255088 |
| В | 1148650331 | | 0 | 11486503313 | 11486503313 |
| | | | | | |

| C D | | | 027856729 006263211 | | | | | 785672932 626321166 | | | |
|--------|---------------|---------|------------------------|----------|--------|-------|-------|---------------------------|----------|----------|----|
| E F | | | 000010737 000001110 | 5 | | 0 | 00 | 001073750 000111057 | 00001 | L073750 | |
| LOT | ХГ | ΧU | R | AUC | τ | JCP | | DIF | | PCT | |
| 1 | 0 | 4 | 1.00000 | 0.0 | 487 (| 0.048 | 7 -1 | .73472E-1 | 8 -3.56 | 206E-15 | , |
| 2 | Δ | 28 | 5 00000 | n n | | | | .60209E-1 | | 2108E-15 | |
| 3 | 28 | 107 | 2.29167 | 0.0 | 285 (| .028 | 5 -4 | .33681E-19 | 9 -1.52 | 2169E-15 | : |
| 4 | 107 | 333 | 1.86076 | 0.0 | 313 (| 0.031 | 3 1 | .73472E-1 | 8 5.54 | 1225E-15 | 1 |
| 5 | 333 | 441 | -0.52212 | 0.0 | 303 (| 0.030 | 3 -1 | .38778E-1 | 7 -4.58 | 8013E-14 | |
| | | | | - | sys=af | RC-54 | | | | | |
| ERROR: | | | | | | | | AMETERS H 30. ITERA | | | |
| L | OT | ХL | χυ | | F | ł | AUC | UCP | DIF | PCT | |
| | 1 | 0 | 900 | | 1 0000 | 10 | 0.02 | 10 | | | |
| | 1 2 | 900 | | | 0.0522 | | 0.02 | | • | • | |
| | 3 | 1753 | | | 0.6189 | | 0.01 | | | • | |
| | 3 4 | 3134 | | | 0.1600 | | 0.01 | | • | • | |
| | | 4294 | | | | - | | | | • | |
| | | | 7697 | | | | | | | • | |
| | 7 | 7697 | | | 0.1459 | | 0.01 | | • | • | |
| | | | | | | | | | • | • | |
| | | | | | SYS=A | SN-6 | 3 | | | | |
| | | | | | | | | DEPEN | | RIABLE T | CA |
| so | URCE | | | DF S | UM OF | SQUA | RES | MEAN S | UARE | | |
| RE | GRESS | ION | | 6 | 27734 | .582 | 905 | 4622.4 | 30484 | | |
| RE | SIDUA | <u></u> | | 4 | 7 | .3820 | 091 | 1.8 | 45523 | | |
| UN | CORRE | CTED ' | TOTAL | 10 | 27741 | .9649 | 996 | MEAN S(4622.4: 1.8 | | | |
| (0 | ORREC | TED T | OTAL) | 9 | 14794 | .094 | 157 | | | | |
| PA | RAMET | ER | ESTIMAT | E. | ASYMP1 | OTIC | | ASY | PTOTIC | 95 % | |
| | | | 0011111 | | STD. E | | | | DENCE IN | | |
| | | | | | | | | LOWER | | UPPER | |
| A | | 1 | .24075291 | 2 1. | 968531 | 3177 | -4.2 | 246922779 | 6.7061 | 981026 | |
| В | | | .21336506 | | | | | 025914974 | | 613666 | |
| č | | | .02851403 | | | | | 054366552 | | 647261 | |
| D | | | .01827548 | | | | | 890384007 | | 874273 | |
| E | | | .00030911 | | | | | 008048642 | | 866403 | |
| F | | | .00000015 | | | | | 000004642 | | 007779 | |
| LO | r : | XIL | XU | R | AUC | ţ | JŒP | I | OIF | PCT | |
| 1 | | 0 7 | 81 1.00 | ากก | 0.1866 | . n | 18658 | 8 0.0000 | 112 C | .006 | |
| 2 | | | 30 -0.80 | | 0.1336 | | 17404 | | | .202 | |
| 2 | 70. | | 55 0.00 | | | | | J.000. | | | |

```
930 1217
                    0.92617 0.1769
                                    0.177948 - 0.001048
                                                          -0.592
       1217
            1358
                   -0.50871 0.1817
                                     0.175628
                                                0.006072
                                                           3.342
    5
       1358
             1450
                   -0.34752
                             0.1772
                                     0.198935
                                               -0.021735
                                                          -12.266
       1450
             1585
                    0.46739
                             0.2189
                                     0.209425
                                                0.009475
                                                           4.329
    7
       1585
            1693
                   -0.20000
                            0.1911
                                     0.193070
                                               -0.001970
                                                          -1.031
            1851
                    0.46296
    8
       1693
                             0.1917
                                     0.192685
                                               -0.000985
                                                          -0.514
    9
       1851
            1887
                   -0.77215
                             0.2005
                                     0.178739
                                                0.021761
                                                          10.853
   10
       1887 1923
                    0.00000
                            0.2145
                                    0.228055 -0.013555
                                                          -6.319
               ----- SYS=ASN-70 ------
NON-LINEAR LEAST SQUARES SUMMARY STATISTICS
                                              DEPENDENT VARIABLE TCA
   SOURCE
                         DF SUM OF SQUARES
                                              MEAN SQUARE
   REGRESSION
                          6
                              119.45541158
                                              19.90923526
   RESIDUAL
                          2
                               0.00058723
                                               0.00029361
   UNCORRECTED TOTAL
                          8
                              119.45599881
   (CORRECTED TOTAL)
                            64.18968336
   PARAMETER
                 ESTIMATE
                            ASYMPTOTIC
                                                 ASYMPTOTIC 95 %
                             STD. ERROR
                                               CONFIDENCE INTERVAL
                                               LOWER
                                                             UPPER
             0.0218463199 0.00609012041 -.00435764119 0.04805028099
   A
             0.0948802807 0.04266164368 -.08867997361 0.27844053493
   C
             0.0232979526 0.00943226876 -.01728627017 0.06388217539
   D
             0.0238339372 0.01260854403 -.03041684523 0.07808471960
             -.0002326897 0.00011062991 -.00070869698 0.00024331766
   Ε
             0.0000003870 0.00000045746 -.00000158130 0.00000235534
   LOT
        XL XU
                           AUC
                       R
                                     UCP
                                                    DIF
                                                             PCT
    1
         0
            152
                  1.00000
                           0.0350 0.0349997
                                               0.000003
                                                           0.0009
                  0.64474
                                   0.0352999
    2
        152
             402
                           0.0353
                                               0.0000001
                                                           0.0002
    3
            483
        402
                 -0.67600
                           0.0342
                                   0.0342276
                                              -0.0000276
                                                          -0.0808
    4
        483
            541
                 -0.28395
                           0.0356
                                   0.0355356
                                               0.0000644
                                                           0.1808
    5
        541
            567
                  -0.55172
                           0.0370
                                   0.0370202
                                              -0.0000202
                                                          -0.0547
    6
        567
            575
                 -0.69231
                           0.0399
                                   0.0382730
                                               0.0016270
                                                           4.0777
    7
        575
            583
                  0.00000
                           0.0370
                                   0.0394846
                                             -0.0024846
                                                          -6.7150
        583
            594
                  0.37500 0.0427 0.0425299
                                               0.0001701
                                                           0.3984
                   NON-LINEAR LEAST SQUARES SUMMARY STATISTICS
                                               DEPENDENT VARIABLE TCA
   SOURCE
                        DF SUM OF SQUARES
                                              MEAN SQUARE
  REGRESSION
                         6
                             383.24385910
                                              63.87397652
  RESIDUAL
                         2
                               0.35975004
                                               0.17987502
  UNCORRECTED TOTAL
                         8
                             383.60360914
   (CORRECTED TOTAL)
                      7
                            61.21154176
```

| FA | (CHI-IE-I | 124 | BUITIMIE | STD. | ERROR | | | DENCE INTERVAL |
|---|--|---|---|---|---|--|--|--|
| 2 | | 0 | 0212275602 | 0.00549 | 101168 | 0.007 | LOWER | UPPER 0.05487051665 |
| A B | | | | | | | | 0.33771756921 |
| č | | | | | | | | 0.14537901155 |
| D | | | | | | | | 0.01324142483 |
| Ē | | | | | | | | 0.00093309836 |
| F | | | | | | | | 0.00000793985 |
| LOT | ХĽ | XU | R | AUC | UCE | P | Dì | F PCT |
| 1 | 0 | 157 | 1.00000 | 0.0464 | 0.045 | 52072 | 0.00119 | 2.5706 |
| 2 | 157 | 353 | 0.24841 | 0.0404 | 0.042 | 26832 | -0.00228 | |
| 3 | 353 | 538 | -0.05612 | 0.0413 | 0.040 | | 0.0011 | |
| 4 | 538 | 781 | 0.31351 | 0.0433 | | | 0.00030 | |
| 5 | 781 | 805 | -0.90123 | | | | 0.00898 | |
| 6 | 805 | 877 | 2.00000 | | | | -0.00132 | |
| 7 | 877 | 933 | -0.22222 | | | | -0.00200 | |
| 8 | 933 | 1050 | 1.08929 | 0.0684 | 0.067 | /6280 | 0.00077 | 720 1.1286 |
| | | | ~~~~~ | SYS= | ASN-108 | } | | |
| | | | | | | | | |
| NON F | TARTAD | TEXE | n compres | CIMMADV (| ጋጥ አጥ ተ ሮጥ | חדרפ | DEDENT | אריי שומבו מויים איים איים איים איים איים איים איים |
| NON-L | INEAR | LEAS' | r squares : | SUMMARY : | S TAT IST | rics | DEPEND | DENT VARIABLE TCA |
| | INEAR URCE | LEAS | | | | | DEPENI MEAN SQ | |
| SO RE | URCE GRESS | ION | | DF SUM OI 5 560 | F SQUAR .630595 | ES 524 | MEAN SQ 112.1261 | QUARE 1905 |
| SO RE RE | URCE GRESS SIDUA | ION L | I | DF SUM OF 5 560 | F SQUAR .630595 | RES 524 000 | mean so | QUARE 1905 |
| SO RE RE | URCE GRESS SIDUA | ION | I | DF SUM OI 5 560 0 0 | F SQUAR .630595 | RES 524 000 | MEAN SQ 112.1261 | QUARE 1905 |
| SO RE RE UN | URCE GRESS SIDUA CORRE | ION L | i TOTAL | DF SUM OF 5 560 0 0 5 560 | F SQUAR .630595 | RES 524 000 524 | MEAN SQ 112.1261 | QUARE 1905 |
| SO RE RE UN | URCE GRESS SIDUA CORRE | TED TO | i TOTAL | DF SUM OF 5 560 0 0 5 560 4 226 | F SQUAR .630595 .000000 | RES 524 000 524 | MEAN SQ 112.1261 0.0000 | QUARE 1905 00000 |
| SO RE RE UN | URCE GRESS SIDUA CORRE ORREC | TED TO | IOTAL OTAL) | DF SUM OF 5 560 0 0 5 560 4 226 | F SQUAR .630595 .000000 .630595 | RES 524 000 524 | MEAN SQ 112.1261 0.0000 | QUARE 1905 |
| SO RE RE UN | URCE GRESS SIDUA CORRE ORREC | ION L CTED ' TED TO | I POTAL OTAL) ESTIMATE | DF SUM OF 5 560 0 0 5 560 4 226 | F SQUAR .630595 .000000 .630595 .667103 PTOTIC ERROR | RES 524 000 524 | MEAN SQ 112.1261 0.0000 ASYM CONFID | DUARE 1905 00000 PTOTIC 95 % DENCE INTERVAL UPPER |
| SO RE RE UN (C) PAI | URCE GRESS SIDUA CORRE ORREC | ION L CTED ' TED TO ER | IOTAL OTAL) ESTIMATE 1578636452 | DF SUM OF 5 560 0 0 5 560 4 226 | F SQUAR .630595 .000000 .630595 .667103 PTOTIC ERROR | RES 524 000 524 333 | MEAN SQ 112.1261 0.0000 ASYM CONFIL LOWER 86364515 | QUARE 1905 00000 PTOTIC 95 % PENCE INTERVAL UPPER 0.15786364515 |
| SO RE UN (C PAI A B | URCE GRESS SIDUA CORRE ORREC | ION L CTED ' TED TO ER 0 | IOTAL OTAL) ESTIMATE 1578636452 1229443753 | DF SUM OF 5 560 0 0 5 560 4 226 | F SQUAR .630595 .000000 .630595 .667103 PTOTIC ERROR 0 | RES 524 000 524 333 0.157 122 | MEAN SQ 112.1261 0.0000 ASYM CONFID LOWER 86364515 94437533 | PTOTIC 95 % PENCE INTERVAL UPPER 0.1578636451512294437533 |
| SO RE UN (C PA A B C | URCE GRESS SIDUA CORRE ORREC | ION L CTED ' TED TO ER 0.: | TOTAL OTAL) ESTIMATE 1578636452 1229443753 0226386425 | DF SUM OF 5 560 0 0 5 560 4 226 | F SQUAR .630595 .000000 .630595 .667103 PTOTIC ERROR 0 0 | RES 524 000 524 333 0.157 122 022 | MEAN SQ 112.1261 0.0000 ASYM CONFID LOWER 86364515 94437533 63864247 | PTOTIC 95 % PENCE INTERVAL UPPER 0.157863645151229443753302263864247 |
| SO RE UN (O PA A B C D | URCE GRESS SIDUA CORRE ORREC | ION L CTED TO | TOTAL OTAL) ESTIMATE 1578636452 1229443753 1226386425 10065149460 | DF SUM OF 5 560 0 0 5 560 4 226 | F SQUAR .630595 .000000 .630595 .667103 PTOTIC ERROR 0 0 | 0.157 122 0.006 | MEAN SQ 112.1261 0.0000 ASYM CONFID LOWER 86364515 94437533 63864247 51494598 | QUARE 1905 00000 PTOTIC 95 % DENCE INTERVAL UPPER 0.15786364515 12294437533 02263864247 0.00651494598 |
| SO RE UN (O PA A B C D E | URCE GRESS SIDUA CORRE ORREC | ION L CTED ' TED TO ER O.: | TOTAL OTAL) ESTIMATE 1578636452 1229443753 1229443753 1229443753 1226386425 10000251335 | DF SUM OF 5 560 0 0 5 560 4 226 | F SQUAR .630595 .000000 .630595 .667103 PTOTIC ERROR 0 0 0 | RES 524 000 524 833 0.157 122 022 0.006 000 | MEAN SQ 112.1261 0.0000 ASYM CONFID LOWER 86364515 94437533 63864247 51494598 02513352 | PTOTIC 95 % PTOTIC 95 % PENCE INTERVAL UPPER 0.157863645151229443753302263864247 0.0065149459800002513352 |
| SO RE UN (O PA A B C D | URCE GRESS SIDUA CORRE ORREC | ION L CTED ' TED TO ER O.: | TOTAL OTAL) ESTIMATE 1578636452 1229443753 1226386425 10065149460 | DF SUM OF 5 560 0 0 5 560 4 226 | F SQUAR .630595 .000000 .630595 .667103 PTOTIC ERROR 0 0 0 | RES 524 000 524 833 0.157 122 022 0.006 000 | MEAN SQ 112.1261 0.0000 ASYM CONFID LOWER 86364515 94437533 63864247 51494598 02513352 | QUARE 1905 00000 PTOTIC 95 % DENCE INTERVAL UPPER 0.15786364515 12294437533 02263864247 0.00651494598 |
| SO RE UN (O PA A B C D E | URCE GRESS SIDUA CORRE ORREC | ION L CTED ' TED TO ER O.: | TOTAL OTAL) ESTIMATE 1578636452 1229443753 1229443753 1229443753 1226386425 10000251335 | DF SUM OF 5 560 0 0 5 560 4 226 | F SQUAR .630595 .000000 .630595 .667103 PTOTIC ERROR 0 0 0 | RES 524 000 524 833 0.157 122 022 0.006 000 | MEAN SQ 112.1261 0.0000 ASYM CONFID LOWER 86364515 94437533 63864247 51494598 02513352 | PTOTIC 95 % PTOTIC 95 % PENCE INTERVAL UPPER 0.157863645151229443753302263864247 0.0065149459800002513352 |
| SO RE UN (C PAI A B C D E F | URCE GRESS SIDUA CORREC ORREC RAMET | ION L CTED ' TED TO ER 0 0 0 | TOTAL OTAL) ESTIMATE 1578636452 1229443753 1226386425 10000251335 10000011142 | DF SUM OF 5 560 0 0 5 560 4 226 ASYMESTD. | F SQUAR .630595 .000000 .630595 .667103 PTOTIC ERROR 0 0 0 | 0.157 122 000 0.000 | MEAN SQ 112.1261 0.0000 ASYM CONFIL LOWER 86364515 94437533 63864247 51494598 02513352 00111416 | PTOTIC 95 % DENCE INTERVAL UPPER 0.157863645151229443753302263864247 0.0065149459800002513352 0.00000111416 |
| SO RE RE UN (C PA B C D E F | URCE GRESS SIDUA CORREC ORREC RAMET | ION L CTED TO TED TO ER O O XU | TOTAL DTAL) ESTIMATE 1578636452 1229443753 0226386425 0065149460 0000251335 0000011142 R | DF SUM OF 5 560 0 0 5 560 4 226 ASYMESTD. | F SQUAR .630595 .000000 .630595 .667103 PTOTIC ERROR 0 0 0 | 0.157 122 000 0.000 | MEAN SQ 112.1261 0.0000 ASYM- CONFID LOWER 86364515 94437533 63864247 51494598 02513352 00111416 | PTOTIC 95 % PENCE INTERVAL UPPER 0.157863645151229443753302263864247 0.0065149459800002513352 0.00000111416 PCT 2.52691E-15 |
| SO RE RE UN (C PA A B C D E F LOT | URCE GRESS SIDUA CORREC ORREC RAMET | ION L CTED TO TED TO ER O.: O.: XU | TOTAL DTAL) ESTIMATE 1578636452 1229443753 0226386425 0065149460 0000251335 0000011142 R 1.00000 | DF SUM OF 560 0 0 5 560 4 226 ASYMISTD. | F SQUAR .630595 .000000 .630595 .667103 PTOTIC ERROR 0 0 0 0 | 0.157 122 022 0.006 000 0.000 | MEAN SQ 112.1261 0.0000 ASYM CONFID LOWER 86364515 94437533 63864247 51494598 02513352 00111416 DIF | PTOTIC 95 % PENCE INTERVAL UPPER 0.157863645151229443753302263864247 0.0065149459800002513352 0.00000111416 PCT 2.52691E-15 3.31054E-15 |
| SO RE RE UN (C PA A B C D E F LOT | URCE GRESS SIDUA CORREC ORREC RAMET XL 0 8 | ION L CTED TO TED TO ER O.: O.: XU 8 39 | TOTAL DTAL) ESTIMATE 1578636452 1229443753 0226386425 0065149460 0000251335 0000011142 R 1.00000 2.87500 | DF SUM OF 560 0 0 5 560 4 226 ASYME STD. AUC 0.1373 0.1048 | F SQUAR .630595 .000000 .630595 .667103 PTOTIC ERROR 0 0 0 0 0 0 0 | 0.157 122 022 0.006 000 0.000 | MEAN SQ 112.1261 0.0000 ASYM CONFID LOWER 86364515 94437533 63864247 51494598 02513352 00111416 DIF 46945E-18 | PTOTIC 95 % PENCE INTERVAL UPPER 0.157863645151229443753302263864247 0.0065149459800002513352 0.00000111416 PCT 2.52691E-15 -3.31054E-15 -1.98481E-15 |

PARAMETER ESTIMATE ASYMPTOTIC ASYMPTOTIC 95 %

| | | DEPENDENT VARIABLE TCA |
|--|--|---|
| SOURCE RECRESSION RESIDUAL UNCORRECTED TOTAL | DF SUM OF SQUARES 6 2884.7700964 0 0.0000000 6 2884.7700964 | MEAN SQUARE 480.7950161 0.0000000 |
| (CORRECTED TOTAL) | | |
| PARAMETER ESTIMA | TE ASYMPTOTIC STD. ERROR | ASYMPTOTIC 95 % CONFIDENCE INTERVAL LOWER UPPER |
| A 0.50678489 B 0.01570396 C 0.11493799 D04218928 E 0.00006480 F00001686 | 71 0 0.0157 53 0 0.1149 94 00427 61 0 0.0000 | 78489172 0.50678489172 70396708 0.01570396708 93799534 0.11493799534 1892894404218928944 06480609 0.00006480609 0168676300001686763 |
| LOT XL XU R | AUC UCP | DIF PCT |
| 6 249 307 -0.2839 | 4 0.5862 0.5862 1.3 5 0.4255 0.4255 -2.6 1 0.3828 0.3828 6.9 6 0.3535 0.3535 -4.3 5 0.3355 0.3355 -5.5 | 38778E-17 -2.36984E-15 38778E-17 2.36742E-15 08167E-17 -4.89229E-15 93889E-18 1.81267E-15 16334E-17 -1.17775E-14 55112E-17 -1.65458E-14 |
| | | DEPENDENT VARIABLE TCA |
| SOI IDCE | DF SUM OF SQUARES 6 300.87807368 0 0.00000000 6 300.87807368 | MEAN SOLIARE |
| (CORRECTED TOTAL) | 5 54.90298664 | |
| PARAMETER ESTIMA A 0.0013196 B 3.4025238 C 1.67935320 D -1.6572794 E -0.0744852 F 0.0004722 | STD. ERROR 22 0 0.001 66 0 3.402 66 0 1.679 43 0 -1.657 55 0 -0.074 | ASYMPTOTIC 95 % CONFIDENCE INTERVAL LOWER UPPER 13196215 0.0013196215 25238662 3.4025238662 03532665 1.6793532665 72794431 -1.6572794431 14852551 -0.0744852551 04722289 0.0004722289 |

| LOT | XL | XU | R | AUC | UCP | | DIF | PCT |
|-------|--------|-------|--------------------|------------|------------|--------|-------------------|------------------|
| 1 | 0 | 12 | 1.00000 | 0.2338 | 0.2338 | A 05 | :722 0_1 7 | 2.07751E-14 |
| 1 | 0 | 12 | | | 0.1643 | | 7556E-17 | 1.68932E-14 |
| 2 | 12 | 38 | 1.16667 | 0.1643 | | | | |
| 3 | 38 | 86 | 0.84615 | 0.1524 | 0.1524 | | 5945E-17 | -2.2/034E-14 |
| 4 | 86 | 134 | 0.00000 | 0.0974 | 0.0974 | | 3167E-17 | 2.13724E-14 |
| 5 | 134 | 184 | 0.04167 | 0.1441 | 0.1441 | |)417E-17 | |
| 6 | 184 | 264 | 0.60000 | 0.1518 | 0.1518 | 8.32 | 2667E-17 | 5.48529E-14 |
| | | | | SYS | =CP-103 | 5N | | |
| | | | | | | | | |
| NON-L | INEAR | LEAS | T SQUARES | SUMMARY | STATIS | TICS | DEPENI | ENT VARIABLE TCA |
| so | URCL | | | DF SUM | OF SQUA | RES | MEAN SO | UARE |
| | GRESS | ION | | 6 20 | 9.24815 | 220 | 34.8746 | 9203 |
| | SIDUA | | | 0 | 0.00000 | 000 | 0.0000 | 00000 |
| | | | TOTAL | | 9.24815 | | | |
| (0 | ORREC | TED I | 'OTAL) | 5 4 | 1.36682 | 739 | | |
| - 1 | - 11 | | T)(7(0) T) (3) (0) | n a.av | NATOMOMT C | ı | 1 CV2 | PTOTIC 95 % |
| PA | RAMET | ER | ESTIMAT | | MPTOTIC | | | ENCE INTERVAL |
| | | | | 210 | . ERROR | | | |
| | | _ | 4.60054053 | | 0 | 0 1600 | LOWER | UPPER |
| A | | | 160061973 | | | | | 0.16006197307 |
| В | | | 184518567 | | | | | 18451856709 |
| С | | | 153132714 | | | | | 0.15313271436 |
| D | | | 204139089 | | | | | 20413908964 |
| E | | | 005209407 | | | | | 0.00520940704 |
| F | | | 000048615 | 8 | 0 | 0000 | 4861585 | 00004861585 |
| LOT | ХГ | χU | R | AUC | UCP | | DIF | PCT |
| 1 | 0 | 12 | 1.00000 | 0.1248 | 0.1248 | | 0 | 0 |
| 2 | 12 | 38 | 1.16667 | 0.0903 | 0.0903 | -6.93 | 889E-18 | -7.68427E-15 |
| 3 | 38 | 86 | 0.84615 | 0.1236 | 0.1236 | -8.67 | 362E-18 | -7.01749E-15 |
| 4 | 86 | 134 | 0.00000 | 0.1287 | 0.1287 | 4.16 | 334E-17 | 3.23492E-14 |
| 5 | 134 | 184 | 0.04167 | 0.1310 | 0.1310 | | | 1.05937E-14 |
| 6 | 184 | | 0.60000 | 0.1154 | 0.1154 | | | -1.95419E-14 |
| | | | | | | | | |
| | | | | SY | S=JTIDS | | | |
| NON-L | INEAR | LEAS | T SQUARES | SUMMARY | STATIS' | rics | DEPEND | ENT VARIABLE TCA |
| SO | URCE | | | DF SUM | OF SOLIA | RES | MEAN SO | UARF. |
| | GRESS: | TON | | | 71.0420 | | | |
| | SIDUA | | | 0 | 0.0000 | | 0.000 | |
| | | | TOTAL | U 5 1 E | 71.0420 | | 0.000 | 0000 |
| OIN | いしてんぱん | עפוע | INTND | n 12 | 11.0420. | J02 | | |
| (0 | ORREC | TED T | OTAL) | 4 | 40.2575 | 028 | | |

| | CAMETE | ₽₹ | ESTIMATE | ASYME | TOTIC | ASYME | TOTIC 95 % |
|--|---------------------------|--|---|---|---|--|--|
| | | | | STD. | ERROR | CONFID | ENCE INTERVAL |
| | | | | | | LOWER | UPPER |
| A | | | 7228105396 | | | 0.72281053955 | |
| В | | | 3744574829 | | | 37445748291 | |
| С | | | 2036849818 | | 0 | 20368498175 | 20368498175 |
| D | | 0. | 2806883737 | | 0 | 0.28068837373 | 0.28068837373 |
| E | | 0. | 0014359721 | | 0 | 0.00143597211 | 0.00143597211 |
| F | | 0. | 0000091069 | | 0 | 0.00000910691 | 0.00000910691 |
| | | | | | | | |
| LOT | XT | VU | R | AUC | UCEP | DIF | PCT |
| | | | | | | | |
| 1 | 0 | 45 | 1.00000 | 0.4068 | 0.4068 | 2.08167E-17 | 5.11718E-15 |
| 2 | 45 | 121 | 0.68889 | 0.2764 | 0.2764 | -3.46945E-17 | -1.25523E-14 |
| 3 | 121 | 198 | 0.01316 | 0.2466 | 0.2466 | -5.20417E-17 | -2.11037E-14 |
| 4 | 198 | 270 | -0.06494 | ^ 2308 | 0.2308 | 2.42861E-17 | 1.05226E-14 |
| 5 | 270 | 327 | -0.20833 | J.2205 | 0.2205 | | -2.51751E-14 |
| | | | | | | | |
| | | | | SYS | =LANNAV | | |
| | | | | | | | |
| NON-L | INEAR | LEAS | T SQUARES | SUMMARY | STATIST | ICS DEPEND | ENT VARIABLE TCA |
| | | | | | | | |
| SO | URCE | | | DF SUM O | F SQUAR | es mean sq | UARE |
| RE | GRESS | ION | | | 39.2255 | 42 14556.53 | 7590 |
| RE | SIDUA | L | | 1 7 873 | 0.0053 | 54 0.00 | 5354 |
| | ~~~~ | | | | | | |
| UN | COKKE | CTED | TOTAL | 7 873 | 39.23089 | 96 | |
| UN | CORRE | CTED | TOTAL | 7 873 | 39.2308 | 96 | |
| | ORREC | | | | 39.23089 86.8228 | | |
| | | | | | | | |
| (C | | TED T | | 6 173 | | 04 | MPTOTIC 95 % |
| (C | ORREC | TED T | OTAL) | 6 173 E A SY | 86.8228 | 04 Asy | MPTOTIC 95 % ENCE INTERVAL |
| (C | ORREC | TED T | OTAL) | 6 173 E A SY | 86.8228 MPTOTIC | 04 Asy | |
| (C | ORREC | TED T TER 1 | OTAL) ESTIMAT | 6 173 E ASY STD. 0.02193 | 86.82280 MPTOTIC ERROR 274964 | ASY CONFID LOWER 1.5368598558 | ENCE INTERVAL UPPER 2.0942148897 |
| (C P. A B | ORREC | TED T TER 1 -0 | OTAL) ESTIMAT .815537373 .136509837 | 6 173 E ASY STD. 0.02193 0.08143 | 86.82280 MPTOTIC ERROR 274964 956615 | ASY CONFID LOWER 1.5368598558 -1.1712809649 | ENCE INTERVAL UPPER 2.0942148897 0.8982612900 |
| (C P. A | ORREC | TED T TER 1 -0 -0 | OTAL) ESTIMAT .815537373 .136509837 .001440080 | 6 173 E ASY STD. 0.02193 0.08143 0.00441 | 86.82280 MPTOTIC ERROR 274964 956615 | ASY CONFID LOWER 1.5368598558 -1.1712809649 -0.0575464571 | ENCE INTERVAL UPPER 2.0942148897 0.8982612900 |
| (C P. A B | ORREC | TED T TER 1 -0 -0 | OTAL) ESTIMAT .815537373 .136509837 .001440080 | 6 173 E ASY STD. 0.02193 0.08143 0.00441 | 86.82280 MPTOTIC ERROR 274964 956615 | ASY CONFID LOWER 1.5368598558 -1.1712809649 | ENCE INTERVAL UPPER 2.0942148897 0.8982612900 |
| (C P. A B C | ORREC | TED T TER 1 -0 -0 0 | OTAL) ESTIMAT .815537373 .136509837 .001440080 .000475466 | 6 173 E ASY STD. 0.02193 0.08143 0.00441 0.00133 | 86.82280 MPTOTIC ERROR 274964 956615 573882 388676 | ASY CONFID LOWER 1.5368598558 -1.1712809649 -0.0575464571 | ENCE INTERVAL UPPER 2.0942148897 0.8982612900 0.0546662979 |
| (C P. A B C D | ORREC | TED T TER 1 -0 -0 0 | ESTIMAT: .815537373 .136509837 .001440080 .000475466 .000337788 | 6 173 E ASY STD. 0.02193 0.08143 0.00441 0.00133 0.00120 | 86.82280 MPTOTIC ERROR 274964 956615 573882 388676 426489 | ASY CONFID LOWER 1.5368598558 -1.1712809649 -0.0575464571 -0.0164728989 | ENCE INTERVAL UPPER 2.0942148897 0.8982612900 0.0546662979 0.0°74238315 |
| (C P A B C D E | ORREC | TED T TER 1 -0 -0 0 | ESTIMAT: .815537373 .136509837 .001440080 .000475466 .000337788 | 6 173 E ASY STD. 0.02193 0.08143 0.00441 0.00133 0.00120 | 86.82280 MPTOTIC ERROR 274964 956615 573882 388676 426489 | ASY CONFID LOWER 1.5368598558 -1.1712809649 -0.0575464571 -0.0164728989 -0.0149636016 | ENCE INTERVAL UPPER 2.0942148897 0.8982612900 0.0546662979 0.0174238315 0.0156391778 |
| (C P A B C D E | ORREC | TED T TER 1 -0 -0 0 | ESTIMAT: .815537373 .136509837 .001440080 .000475466 .000337788 | 6 173 E ASY STD. 0.02193 0.08143 0.00441 0.00133 0.00120 | 86.82280 MPTOTIC ERROR 274964 956615 573882 388676 426489 | ASY CONFID LOWER 1.5368598558 -1.1712809649 -0.0575464571 -0.0164728989 -0.0149636016 | ENCE INTERVAL UPPER 2.0942148897 0.8982612900 0.0546662979 0.0174238315 0.0156391778 |
| (C P. A B C D E F | ORREC | TER 1 -0 -0 0 -0 -0 | ESTIMAT: .815537373 .136509837 .001440080 .000475466 .000337788 .000001275 | 6 173 E ASY STD. 0.02193 0.08143 0.00441 0.00133 0.00120 0.00000 | 86.82280 MPTOTIC ERROR 274964 956615 573882 388676 426489 452195 | ASY CONFID LOWER 1.5368598558 -1.1712809649 -0.0575464571 -0.0164728989 -0.0149636016 -0.0000587312 | ENCE INTERVAL UPPER 2.0942148897 0.8982612900 0.0546662979 0.0 74238315 0.0 56391778 0.0000561805 |
| (C P. A B C D E F | ORREC | TER 1 -0 -0 0 -0 -0 | ESTIMAT: .815537373 .136509837 .001440080 .000475466 .000337788 .000001275 | 6 173 E ASY STD. 0.02193 0.08143 0.00441 0.00133 0.00120 0.00000 | 86.82280 MPTOTIC ERROR 274964 956615 573882 388676 426489 452195 | ASY CONFID LOWER 1.5368598558 -1.1712809649 -0.0575464571 -0.0164728989 -0.0149636016 -0.0000587312 | UPPER 2.0942148897 0.8982612900 0.0546662979 0.0 74238315 0.0 56391778 0.0000561805 |
| P. A B C D E F | ORREC ARAME | TED T TER 1 -0 -0 0 0 -0 | ESTIMAT .815537373 .136509837 .001440080 .000475466 .000337788 .000001275 | 6 173 E ASY STD. 0.02193 0.08143 0.00441 0.00133 0.00120 0.00000 | 86.82280 MPTOTIC ERROR 274964 956615 573882 388676 426489 452195 | ASY CONFID LOWER 1.5368598558 -1.1712809649 -0.0575464571 -0.0164728989 -0.0149636016 -0.0000587312 DIF | ENCE INTERVAL UPPER 2.0942148897 0.8982612900 0.0546662979 0.0 74238315 0.0 56391778 0.0000561805 PCT 0.560519 |
| P. A B C D E F LOT | ORREC ARAME XL 0 | TTED TOTER 1 -0 -0 0 -0 XU | ESTIMAT .815537373 .136509837 .001440080 .000475466 .000337788 .000001275 | 6 173 E ASY STD. 0.02193 0.08143 0.00441 0.00133 0.00120 0.00000 AUC 1.7500 | 86.82280 MPTOTIC ERROR 274964 956615 573882 388676 426489 452195 | ASY CONFID LOWER 1.5368598558 -1.1712809649 -0.0575464571 -0.0164728989 -0.0149636016 -0.0000587312 DIF | ENCE INTERVAL UPPER 2.0942148897 0.8982612900 0.0546662979 0.0 74238315 0.0 56391778 0.0000561805 PCT 0.560519 |
| P. A B C D E F LOT 1 | XL 0 4 | TED T TER 1 -0 -0 0 0 -0 XU 4 38 | ESTIMAT: .815537373 .136509837 .001440080 .000475466 .000337788 .000001275 R 1.00000 7.50000 | 6 173 E ASY STD. 0.02193 0.08143 0.00441 0.00133 0.00120 0.00000 AUC 1.7500 1.3199 | 86.82280 MPTOTIC ERROR 274964 956615 573882 388676 426489 452195 UCP 1.74019 1.31992 | ASY CONFID LOWER 1.5368598558 -1.1712809649 -0.0575464571 -0.0164728989 -0.0149636016 -0.0000587312 DIF 0.00980909 2 -0.00002284 9 0.00000639 | ENCE INTERVAL UPPER 2.0942148897 0.8982612900 0.0546662979 0.0 74238315 0.0_56391778 0.0000561805 PCT 0.560519 -0.001730 0.000594 |
| A B C D E F LOT | XL 0 4 38 | TED T TER 1 -0 -0 0 XU 4 38 176 | ESTIMAT: .815537373 .136509837 .001440080 .000475466 .000337788 .000001275 R 1.00000 7.50000 3.05882 | 6 173 E ASY STD. 0.02193 0.08143 0.00441 0.00133 0.00120 0.00000 AUC 1.7500 1.3199 1.0761 | 86.82280 MPTOTIC ERROR 274964 956615 573882 388676 426489 452195 UCP 1.74019 1.31992 1.07609 | ASY CONFID LOWER 1.5368598558 -1.1712809649 -0.0575464571 -0.0164728989 -0.0149636016 -0.0000587312 DIF 9 0.00980909 2 -0.00002284 9 0.00000639 4 -0.00024087 | UPPER 2.0942148897 0.8982612900 0.0546662979 0.0*74238315 0.0_56391778 0.0000561805 PCT 0.560519 -0.001730 0.000594 -0.024886 |
| P. A B C D E F LOT 1 2 3 4 | XL 0 4 38 176 | TED T TER 1 -0 -0 0 -0 XU 4 38 176 320 | ESTIMAT: .815537373 .136509837 .001440080 .000475466 .000337788 .000001275 R 1.00000 7.50000 3.05882 0.04348 | 6 173 E ASY STD. 0.02193 0.08143 0.00441 0.00133 0.00120 0.00000 AUC 1.7500 1.3199 1.0761 0.9679 | 86.82280 MPTOTIC ERROR 274964 956615 573882 388676 426489 452195 UCP 1.74019 1.31992 1.07609 0.96814 | ASY CONFID LOWER 1.5368598558 -1.1712809649 -0.0575464571 -0.0164728989 -0.0149636016 -0.0000587312 DIF 0.00980909 2 -0.00002284 0.00000639 4 -0.00024087 5 0.00033823 | UPPER 2.0942148897 0.8982612900 0.0546662979 0.0*74238315 0.0*56391778 0.0000561805 PCT 0.560519 -0.001730 0.000594 -0.024886 0.036828 |
| A B C D E F LOT 1 2 3 4 5 | XL 0 4 38 176 | TED T TER 1 -0 -0 0 -0 XU 4 38 176 320 464 | ESTIMAT: .815537373 .136509837 .001440080 .000475466 .000337788 .000001275 R 1.00000 7.50000 3.05882 0.04348 0.00000 | 6 173 E ASY STD. 0.02193 0.08143 0.00441 0.00133 0.00120 0.00000 AUC 1.7500 1.3199 1.0761 0.9679 0.9184 | 86.82280 MPTOTIC ERROR 274964 956615 573882 388676 426489 452195 UCP 1.74019 1.31992 1.07609 0.96814 0.91806 | ASY CONFID LOWER 1.5368598558 -1.1712809649 -0.0575464571 -0.0164728989 -0.0149636016 -0.0000587312 DIF 0.00980909 2 -0.00002284 0.00000639 4 -0.00024087 5 0.00033823 L -0.00010702 | UPPER 2.0942148897 0.8982612900 0.0546662979 0.0 74238315 0.0 56391778 0.0000561805 PCT 0.560519 -0.001730 0.000594 -0.024886 0.036828 |

----- SYS=LANTARP -----

| NON-L | INEAR | | | | | STATIS | TICS | 5 DEPEN | LENT VARIABLE TCA | | |
|---|--|-------------------|--|----------------------------|----------------------------------|--|----------------------------------|---|--|--|--|
| SOURCE RECRESSION RESIDUAL UNCORRECTED TOTAL | | | | DF 6 1 7 | SUM (648 | OF SQUA 303.866 0.014 303.880 | 662 | 10800.6 | 44444 | | |
| (C | ORREC | TED TO | TAL) | 6 | 127 | 795.420 | 992 | | | | |
| PA | RAMET | ER | ESTIMATE | E ASYMPTOTIC STD. ERROR | | | ; | ASYI CONFII LOWER | ASYMPTOTIC 95 % CONFIDENCE INTERVAL LOWER UPPER | | |
| A B C D E F | | -0. -0. 0. | 201283770 004728681 001547595 001401953 | 0. 0. 0. | 08644 00422 00131 00126 | 4487134 2865218 1046069 5344957 | -1. -0. -0. | 1058339233 2996523050 0584579361 0151031182 | 1.9773379532 0.8970847655 0.0490005732 0.0181983090 0.0174553435 | | |
| LOT | ХГ | XU | R | AU | IC . | UCP | | DIF | PCT | | |
| 4 5 | 0 4 38 166 310 454 598 | 310 454 598 | 0.00000 -0.19444 | 1. 0. 0. 0. | 7795 7619 | 1.128 0.937 0.848 0.807 0.779 0.761 | 57 51 86 81 91 89 | -0.023090 0.000030 -0.000012 0.000137 0.000288 -0.000409 0.000006 | 0.0026 -0.0013 0.0161 0.0357 -0.0525 0.0008 | | |
| NON-T. | INEAR | T.EAST | | | | | | | DENT VARIABLE TCA | | |
| SOI REI REI | URCE GRESS SIDUAL | ION | [| OF 5 | SUM C 119 | F SQUA | RES 467 000 | MEAN SQ 2387.67 | QUARE | | |
| (3) | ORREC | ted to | TAL) | 4 | 14 | 83.530 | 658 | | | | |
| PAI | RAMETI | | ESTIMATE | | | PTOTIC ERROR | | | MPTOTIC 95 % DENCE INTERVAL UPPER | | |
| A B C D E F | | 0 0.0 0 | 997170701 435003603 438966071 258765392 001320020 000005200 | | | 0 0 0 | 0 0.0 0 0 | 9971707010 4350036028 4389660715 2587653915 0013200201 | 0.49971707010 04350036028 0.04389660715 02557653915 00013200201 00000051995 | | |

| LOT | ХL | XU | R | AUC | UCP | DIF | PCT |
|-----|-----|-----|----------|--------|--------|--------------|--------------|
| 1 | 0 | 79 | 1.00000 | 0.4383 | 0.4383 | 1.38778E-17 | 3.16628E-15 |
| 2 | 79 | 271 | 1.43038 | 0.3353 | 0.3353 | -4.85723E-17 | -1.44862E-14 |
| 3 | 271 | 463 | 0.00000 | 0.2975 | 0.2975 | -3.46945E-17 | -1.16620E-14 |
| 4 | 463 | 655 | 0.00000 | 0.2865 | 0.2865 | -6.93889E-17 | -2.42195E-14 |
| 5 | 655 | 720 | -0.66146 | 0.2693 | 0.2693 | 6.93889E-18 | 2.57664E-15 |
| | | | | | | | |

C.7.4 - Helicopter Programs

------ SYS=HH-52-----

NOTE: THE RESIDUAL SS HAS FAILED TO CONVERGE IN THE SPECIFIED NUMBER OF ITERATIONS.

| LOT | ХГ | XU | R | AUC | UCP | DIF | PCT |
|-----|------------|----|----------|-------|-----|-----|-----|
| 1 | 0 | 28 | 1.00000 | 1.577 | | • | |
| 2 | 28 | 43 | -0.46429 | 1.104 | | | |
| 3 | 43 | 60 | 0.13333 | 1.085 | • | | |
| 4 | 60 | 75 | -0.11765 | 1.012 | • | | |
| 5 | 7 5 | 87 | -0.20000 | 1.041 | | • | |
| 6 | 87 | 99 | 0.00000 | 1.055 | • | | • |

NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA

 SOURCE
 DF
 SUM OF SQUARES
 MEAN SQUARE

 REGRESSION
 6
 357821.38843
 59636.89807

 RESIDUAL
 2
 1791.63073
 895.81536

 UNCORRECTED TOTAL
 8
 359613.01916

(CORRECTED TOTAL) 7 57764.44745

| PARA | AMETER | ES | TIMATE | AS | MPTOT | IC | | ASY | 1PTOT | C 95 % | |
|------|--------|--------|--------|-------|---------|----|---------|--------|-------|-----------|--|
| | | | | STI | D. ERRO | OR | | CONFI | DENCE | INTERVAL | |
| | | | | | | | | LOWER | | UPPER | |
| A | | 9.322 | 454628 | 4.270 | 778129 | 97 | -9.0534 | 224310 | 27.6 | 598331687 | |
| В | | -0.162 | 306695 | 0.149 | 71920 | 53 | -0.8065 | 035190 | 0.4 | 481890130 | |
| С | | -0.036 | 788011 | 0.034 | 174306 | 64 | -0.1838 | 297990 | 0.1 | L10253777 | |
| D | | -0.007 | 432906 | 0.042 | 242924 | 53 | -0.1899 | 932201 | 0.1 | 175127408 | |
| E | | -0.001 | 451244 | 0.002 | 2127450 | 02 | -0.0106 | 050243 | 0.0 | 007702536 | |
| F | | 0.000 | 006080 | 0.000 | 0009212 | 27 | -0.0000 | 335590 | 0.0 | 000045720 | |
| _ | | | | | | | | | | | |
| LOT | ХГ | ΧU | i | R 2 | AUC | | UCP | Ε | OIF | PCT | |
| | | | | | | | | | | | |
| 1 | 0 | 14 | 1.000 | 00 7 | 7.541 | 6 | .63693 | 0.90 | 1407 | 11.989 | |
| 2 | 14 | 50 | 1.571 | 43 3 | 3.898 | 3 | .57457 | 0.32 | 2343 | 8.297 | |
| 3 | 50 | 110 | 0.666 | 57 2 | 2.766 | 3 | .06946 | -0.30 | 346 | -10.971 | |
| 4 | 110 | 195 | 0.416 | - | 2.419 | 2 | .55480 | -0.13 | 3580 | -5.614 | |

```
5
      195 394 1.34118 1.986 1.98788 -0.00188 -0.095
       394 486 -0.53769 2.236 2.34645 -0.11045
   6
                                                      -4.940
   7
       486 576 -0.02174 2.370 2.03160 0.33840 14.279
       576
           624 -0.46667 2.547 2.55410 -0.00710 -0.279
             ----- SYS=H-53 ------
NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA
                    DF SUM OF SQUARES MEAN SQUARE
6 619062.83448 103177.13908
2 15.93078 7.96539
   SOURCE
   REGRESSION
   RESIDUAL
   UNCORRECTED TOTAL 8 619078.76526
   (CORRECTED TOTAL) 7 355155.11828
   PARAMETER
             ESTIMATE ASYMPTOTIC
                                           ASYMPTOTIC 95 %
                         STD. ERROR
                                          CONFIDENCE INTERVAL
                                          LOWER UPPER
            7.660410922 0.43240009023 5.7999230535 9.5208987900
  Δ
           -0.089077522 0.02743778554 -0.2071340818 0.0289790379
            0.022361226 0.00706204652 -0.0080246415 0.0527470936
           -0.001734750 0.00052040790 -0.0039739087 0.0005044095
  D
           -0.003510148 0.00137348874 -0.0094198578 0.0023995622
  E
           0.000022733 0.00000871121 -0.0000147491 0.0000602143
  LOT XL XU
                          AUC
                                  UCEP
                     R
                                              DIF
                                                      PCT
             10 1.0000 6.752 6.75069 0.00131
                                                     0.019
   1
        0
   2
        10 141 12.1000 4.264 4.26402 -0.00002 -0.000
   3
        141 281 0.0687 3.762 3.76199 0.00001 0.000
   4
       281 293 -0.9143 3.382 3.28108 0.10092
                                                      2.984
       293 323 1.5000 3.341
   5
                                  3.35137 -0.01037 -0.310
                 -0.7333 3.154
2.7500 3.685
       323
             331
                                  3.54594 -0.39194 -12.427
   7
        331
             361
                                  3.67701 0.00799 0.217
        361
           367 -0.8000 3.947
                                  3.59430 0.35270
                                                      8.936
    ------ SYS=CH-47 --------
NON-LINEAR LEAST SQUARES SUMMARY STATISTICS
                                         DEPENDENT VARIABLE TCA
                    DF SUM OF SQUARES MEAN SQUARE 6 480190.32300 80031.72050 6 5670.21199 945.03533
  SOURCE
  REGRESSION
  RESIDUAL
  UNCORRECTED TOTAL 12 485860.53499
  (CORRECTED TOTAL)
                    11 132801.70813
  PARAMETER
              ESTIMATE ASYMPTOTIC
                                           ASYMPTOTIC 95 %
                         STD. ERROR
                                         CONFIDENCE INTERVAL
                                          LOWER
           5.531826052 2.1708353906 0.21997937394 10.843672730
           -0.011485309 0.0996756834 -.25538309584 0.232412478
```

```
0.103238252
   C
            -0.028148940
                        0.0222075562 -.08248891190
                                                     0.026191032
   D
            -0.001788743  0.0011816651  -.00468017517
                                                     0.001102690
   E
             0.000020921
   F
             ΧU
                             AUC
                                     UCP
                                                  DIF
                                                            PCT
  LOT
        XL
                        R
             18
                            6.181
                                    5.08695
                                              1.09405
                                                         17.700
        0
                   1.00000
  1
                                                         9.217
             42
                            5.226
                                    4.74430
                                              0.48170
   2
                   0.33333
       18
                   0.00000
                            4.559
                                    4.52097
                                              0.03803
                                                         0.834
   3
       42
             66
                   1.50000
                            3.459
                                    3.18207
                                              0.27693
                                                         8.006
   4
       66
            126
   5
                   0.20000
                            2.760
                                    3.27897
                                             -0.51897
                                                        -18.803
      126
            198
            358
                            2.307
                                    2.46305
                                            -0.15605
                                                         -6.764
   6
      198
                   1.22222
                                                         -6.954
   7
      358
            442
                  -0.47500
                            2.313
                                    2.47385
                                             -0.16085
   8
      442
            585
                  0.70238
                            2.695
                                    2.43170
                                              0.26330
                                                         9.770
                                    2.74814
                                              0.71486
                                                         20.643
   9
      585
                            3.463
            630
                  -0.68531
                  -0.20000
                            3.085
                                    3.43485
                                             -0.34985
                                                        -11.340
  10
      630
            666
      666
            678
                  -0.66667
                            3.671
                                    3.71654
                                             -0.04554
                                                        -1.241
  11
            690
                   0.00000
                            3.852
                                    4.48835
                                            -0.63635
                                                        -16.520
  12
      678
    ----- SYS=H-54 -----
NON-LINEAR LEAST SQUARES SUMMARY STATISTICS
                                            DEPENDENT VARIABLE TCA
                                           MEAN SQUARE
  SOURCE
                       DF SUM OF SQUARES
                                            4225.757782
                            21128.788908
  REGRESSION
                        5
                                               0.000000
  RESIDUAL
                        0
                                0.000000
                       5
                            21128.788908
  UNCORRECTED TOTAL
                       4
                            3891.650213
   (CORRECTED TOTAL)
                ESTIMATE
                           ASYMPTOTIC
                                               ASYMPTOTIC 95 %
  PARAMETER
                                             CONFIDENCE INTERVAL
                           STD. ERROR
                                             LOWER
                                    0 5.3268853100 5.3268853100
  A
             5.326885310
            -0.115212040
                                    0 -..1152120399 -0.1152120399
  В
                                    0 0.0673272052 0.0673272052
  C
             0.067327205
                                    0 -0.0295141675 -0.0295141675
  D
            -0.029514167
  E
             0.012730861
                                    0 0.0127308607 0.0127308607
                                    0 -0.0005017380 -0.0005017380
  F
            -0.000501738
 LOT
    XL
         ΧU
                   R
                      AUC
                             UCP
                                           DIF
      0
              1.00000
                      5.248 5.248
                                              0
 1
         6
  2
                      3.388
                             3.388
                                   -1.66533E-16
                                                -4.91539E-15
      6
         30
              3.00000
  3
     30
         60
              0.25000
                      2.801 2.801
                                   -5.55112E-17 -1.98183E-15
                      3.402 3.402
                                   1.66533E-16
                                                4.89516E-15
  4
     60
         83
             -0.23333
     83
            -0.73913 3.083 3.083
                                   1.66533E-16
                                                5.40167E-15
```

89

| | | | | | 0' | vc_uu_6 | UD | | | | |
|--------|------------|--------|---------------------------------------|------|------|---|----------------|-------------------|---|---|--|
| | SYS=HH-60D | | | | | | | | | | |
| NON-LI | NEAR I | LEAST | SQUARES | SUMM | IARY | STATIS' | rics | DEPEN | DENT VARIABLE TO | A | |
| SOU |) (Tr | | | מת | i me | OF SOLIA | 27.5 | MEAN S | DUARE | | |
| | RESSIO | NI. | | 4 | | | | 30973.0 | | | |
| DEC. | TESSIC | λίΑ | | 7 | 12. | 0 00 00 | nnn | 0.0 | | | |
| KES. | I DONO | | OTAL | A | 10 | 2002 22 | 200 | 0. | 30000 | | |
| UNC | JRRECI | וצט זו | JIAL | 4 | 12. | 3032.22 | 000 | | | | |
| (00) | RECTE | ED TO | PAL) | 3 | 2 | 4351.97 | 000 | | | | |
| PAR | AMETTER | 2 | ESTIMATE | | ASYI | PTOTIC | | ASY | APTOTIC 95 % DENCE INTERVAL | | |
| Linu | | • | | | STD | ERROR | | CONFI | DENCE INTERVAL | | |
| | | | | | 0.0 | | | LOWER | UPPER 9.2112265487 -0.0214596792 | | |
| A | | 9 ' | 211226549 | | | Ω | 9. | 2112265487 | 9.2112265487 | | |
| В | | | 21459679 | | | n | -0. | 0214596792 | -0.0214596792 | | |
| c | | | 014681265 | | | n | ٥. | 0146812647 | 0.0146812647 | | |
| | | | 002671138 | | | | | | -0.0026711380 | | |
| D E | | | 001209662 | | | | | | -0.0012096623 | | |
| | | | | | | | | | -0.000209333 | | |
| F | | -0.0 | 000020933 | | | U | -0. | 000020333 | -0.0000207333 | | |
| LOT | ХГ | XU | Я | A | UC | UCP | | DIF | PCT | | |
| 1 | 0 | 3 | 1 0000 | ก | 9 2 | 9.2 | 2 | .22045E-16 | 2.41353E-15 | | |
| 2 | 3 | 28 | 7 3333 | 3 | 7 1 | 7 1 | 1 | 11022E-16 | 2.41353E-15 1.56369E-15 3.31410E-15 | | |
| 3 | 28 | 62 | 0.4000 | | 67 | 67 | 2 | 220458-16 | 3 31410E-15 | | |
| 3 4 | 63 | 92 | 0.4000 | 2 | 6 6 | 6.7 | <u>د</u> _د | .99201E-16 | -1.51394E-14 | | |
| 7 | 63 | 32 | -0.1/14 | J | 0.0 | 0.0 | | .)) 2012 10 | 1.313346 14 | | |
| | | | | | - s | YS=SH-3 | | | | | |
| | | | | | | | | | | | |
| NON-LI | NEAR [| EAST | SQUARES | SUMM | ARY | STATIS | rics | DEPENI | DENT VARIABLE TO | A | |
| SOUE | RCE | | | DF S | UM (| OF SQUA | RES | MEAN S | OUARE | | |
| REG | RESSIC | N | | 6 | 728 | 355.311 | 085 | 12142.55 40.33 | 51847 | | |
| RES | DUAL. | | | 3 | | 121.002 | 457 | 40.33 | 34152 | | |
| UNCY | RREY | אר משי | YTAI. | 9 | 729 | 976.313 | 542 | | | | |
| 0.10 | oldwo. | | , , , , , , , , , , , , , , , , , , , | ~ | | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | | | | |
| (CO | RECTE | D TO | ral) | 8 | 130 | 013.690 | 662 | | | | |
| PARA | AMETER | 2 | ESTIMATE | | ASY | PTOTIC | | ASY | 1PTOTIC 95 % | | |
| | | | · | | | . ERROR | | | DENCE INTERVAL | | |
| | | | | | | | | LOWER | UPPER | | |
| A | | 3.8 | 382573865 | 0.6 | 719 | 8971344 | 1. | | 6.0211811279 | | |
| В | | | | | | | | 3303713510 | | | |
| Ĉ | | | | | | | | | 0.0960660742 | | |
| D | | | | | | | | 0613240946 | | | |
| ש | | -0.0 | 102340328 | 0.0 | 104 | 100/120 | -0. | 0013440340 | 0.0002430300 | | |

 $-0.003812695 \ 0.00276820656 \ -0.0126225128 \ 0.0049971220$

0.000040903 0.00002614513 -0.0000423035 0.0001241103

E

| LOT | ХĽ | ΧU | R | AUC | UCP | DIF | PCT |
|-----|-----|-----|----------|-------|---------|----------|---------|
| 1 | 0 | 20 | 1.00000 | 3.327 | 3.22451 | 0.10249 | 3.080 |
| 2 | 20 | 69 | 1.45000 | 2.480 | 2.51039 | -0.03039 | -1.225 |
| 3 | 69 | 140 | 0.44898 | 2.319 | 2.32774 | -0.00874 | -0.377 |
| 4 | 140 | 185 | -0.36620 | 1.811 | 1.78191 | 0.02909 | 1.607 |
| 5 | 185 | 221 | -0.20000 | 1.870 | 1.80115 | 0.06885 | 3.682 |
| 6 | 221 | 257 | 0.00000 | 1.589 | 1.80421 | -0.21521 | -13.544 |
| 7 | 257 | 287 | -0.16667 | 1.703 | 1.80007 | -0.09707 | -5.700 |
| 8 | 287 | 335 | 0.60000 | 1.930 | 1.82227 | 0.10773 | 5.582 |
| 9 | 335 | 350 | -0.68750 | 2.144 | 1.92193 | 0.22207 | 10.358 |

C.7.5 - Tactical Armament Programs

ERROR: ON OBSERVATION 1, USE OF THE ABOVE PARAMETERS HAS RESULTED IN A DERIVATIVE OR RESIDUAL IN EXCESS OF 1E30. ITERATIONS TERMINATED.

| LOT | ХL | VU | R | AUC | UCP | DIF | PCT |
|-----|-------|--------|----------|--------|-----|-----|-----|
| 1 | 0 | 1600 | 1.00000 | 0.0275 | | | • |
| 2 | 1600 | 4550 | 0.84375 | 0.0206 | | • | |
| 3 | 4550 | 8290 | 0.26780 | 0.0189 | • | • | |
| 4 | 8290 | 17270 | 1.40107 | 0.0162 | | | • |
| 5 | 17270 | 26890 | 0.07127 | 0.0147 | | • | • |
| 6 | 26890 | 41290 | 0.49688 | 0.0137 | | • | |
| 7 | 41290 | 56890 | 0.08333 | 0.0129 | • | • | • |
| 8 | 56890 | 72490 | 0.00000 | 0.0123 | • | • | |
| 9 | 72490 | 88090 | 0.00000 | 0.0118 | • | • | |
| 10 | 88090 | 100000 | -0.23654 | 0.0115 | | • | • |

ERROR: ON OBSERVATION 2, USE OF THE ABOVE PARAMETERS HAS RESULTED IN A DERIVATIVE OR RESIDUAL IN EXCESS OF 1E30. ITERATIONS TERMINATED.

| LOT | XL | ΧU | R | AUC | UCEP | DIF | PCT |
|-----|--------|--------|----------|---------|------|-----|-----|
| 1 | 0 | 172 | 1.00000 | 0.06924 | | • | • |
| 2 | 172 | 1432 | 6.32558 | 0.03038 | | • | • |
| 3 | 1432 | 7557 | 3.86111 | 0.01988 | | • | • |
| 4 | 7557 | 21777 | 1.32163 | 0.01765 | | • | |
| 5 | 21777 | 50227 | 1.00070 | 0.01619 | | • | • |
| 6 | 50227 | 85247 | 0.23093 | 0.01401 | | • | |
| 7 | 85247 | 134157 | 0.39663 | 0.01258 | | • | |
| 8 | 134157 | 171666 | -0.23310 | 0.01181 | | • | |

| | | | | | | ava | ~~ | | | | | | | |
|-----|--------|---------|---------|--------|-----|-------|------|------|--------|-------|--------|-------|----------|----------|
| | | | | | | - SYS | =GB(| 0-T2 | , | | | | | |
| NON | I-LIN | VEAR LI | EAST S | UARES | SUM | MARY | STA | rist | rics | | DEPEN | DENT | VARIABLE | TCA |
| | SOUF | CE | | , | DF | SUM O | F S | QUAF | ŒS | 1 | MEAN S | QUARE | 2 | |
| | REGE | ESSIO | N | | 6 | 400 | 59.0 | 0721 | .27 | (| 6676.5 | 12021 | _ | |
| | RESI | DUAL | | | 3 | | 21. | 2141 | .10 | | 7.0 | 71370 |) | |
| | UNCC | RRECTI | ED TOTA | L | 9 | 400 | 80.2 | 2862 | 237 | | | | | |
| | (COF | RECTE | TOTAL | .) | 8 | 102 | 25. | 3996 | 32 | | | | | |
| | PARA | METER | ES | TIMATE | | ASYM | PTO: | ric | | | ASY | 1PTOI | 'IC 95 % | |
| | | | | | | STD. | | | | | | | INTERVA | <u>.</u> |
| | | | | | | | | | | | LOWER | | UPPE | ? |
| | A | | 0.3258 | 410059 | 0. | 17004 | 5138 | 535 | 21 | .5321 | 764050 | 0.86 | 70096523 | 8 |
| | В | | 0972 | 556418 | 0. | 15974 | 8545 | 554 | 60 | 565 | 538797 | 0.41 | 11441043 | 9 |
| | С | | 0.0159 | 924614 | 0. | 00945 | 987 | 765 | 01 | .4113 | 359919 | 0.04 | 60985220 | 8 |
| | D | | 0046 | 008434 | 0. | 00170 | 7806 | 583 | 01 | .003 | 593862 | 0.00 | 08342518 | 7 |
| | E | | 0002 | 335444 | 0. | 00044 | 3809 | 508 | 00 | 1649 | 595403 | 0.00 | 11788653 | L |
| | F | | 0.0000 | 003796 | 0. | 00000 | 0469 | 940 | 00 | 0001 | L11426 | 0.00 | 00018734 | 3 |
| | Lot | ХL | ΧU | | R | AUC | ! | บ | CP | | DIF | | PCT | |
| | 1 | 0 | 40 | 1.00 | 000 | 0.1 | 975 | 0. | 2538 | 70 | -0.056 | 370 | -28.542 | |
| | 2 | 40 | 105 | 0.629 | 500 | 0.2 | 000 | 0. | 2107 | 82 | -0.010 | 782 | -5.391 | |
| | 3 | 105 | 445 | 4.230 | 77 | 0.1 | 439 | 0. | 1441 | .07 | -0.000 | 207 | -0.144 | |
| | 4 | 445 | 695 | -0.264 | 471 | 0.1 | 483 | 0. | 1372 | 32 | 0.011 | .068 | 7.463 | |
| | 4 5 | 695 | 1015 | 0.280 | 000 | 0.1 | 308 | 0. | 1365 | 07 | -0.005 | 707 | -4.363 | |
| | 6 | 1015 | 1615 | 0.875 | 500 | 0.1 | 718 | 0. | 1705 | 67 | 0.001 | .233 | 0.717 | |
| | 7 | 1615 | 2215 | 0.000 | 000 | 0.1 | 539 | 0. | 1522 | 71 | 0.001 | .629 | 1.058 | |
| | 8 | 2215 | 2815 | 0.000 | 000 | 0.1 | 483 | 0. | 1481 | 19 | 0.000 | 181 | 0.122 | |
| | ۵ | 2015 | 2/15 | 0.000 | 100 | 0 1 | 420 | ^ | 1 4 40 | 40 | 0.000 | A 4 0 | 0.076 | |

C.7.6 - Tactical Missile Programs

2815 3415

----- SYS=AMRAAM -----

0.00000 0.1420 0.144948 -0.002948 -2.076

ERROR: ON OBSERVATION 2, USE OF THE ABOVE PARAMETERS HAS RESULTED IN A DERIVATIVE OR RESIDUAL IN EXCESS OF 1E30. ITERATIONS TERMINATED.

| LOT | ХL | χυ | R | AUC | UCEP | DIF | PCT |
|-----|-------|-------|----------|-------|------|-----|-----|
| 1 | 0 | 194 | 1.00000 | 1.233 | | | |
| 2 | 194 | 1251 | 4.44845 | 0.512 | , | • | • |
| 3 | 1251 | 3215 | 0.85809 | 0.342 | | | |
| 4 | 3215 | 6211 | 0.52546 | 0.257 | • | | |
| 5 | 6211 | 9111 | -0.03204 | 0.232 | • | • | • |
| 6 | 9111 | 12011 | 0.00000 | 0.194 | • | • | |
| 7 | 12011 | 14911 | 0.00000 | 0.182 | | , | |
| 8 | 14911 | 17911 | 0.03448 | 0.170 | • | • | • |
| 9 | 17911 | 20911 | 0.00000 | 0.158 | • | • | • |
| 10 | 20911 | 24674 | 0.25433 | 0.155 | | | |

ERROR: ON OBSERVATION 5, USE OF THE ABOVE PARAMETERS HAS RESULTED IN A DERIVATIVE OR RESIDUAL IN EXCESS OF 1E30. ITERATIONS TERMINATED.

| LOT | ХL | XU | R | AUC | UCP | DIF | PCT |
|-----|-------|-------|----------|-------|-----|-----|-----|
| 1 | 0 | 80 | 1.00000 | 0.809 | | • | • |
| 2 | 80 | 316 | 1.95000 | 0.517 | • | • | |
| 3 | 316 | 712 | 0.67797 | 0.400 | • | | |
| 4 | 712 | 1399 | 0.73485 | 0.314 | • | • | |
| 5 | 1399 | 3144 | 1.54003 | 0.249 | • | • | |
| 6 | 3144 | 5612 | 0.41433 | 0.223 | • | | • |
| 7 | 5612 | 7731 | -0.14141 | 0.208 | • | • | |
| 8 | 7731 | 9863 | 0.00613 | 0.197 | | • | |
| 9 | 9863 | 12863 | 0.40713 | 0.184 | • | • | |
| 10 | 12863 | 15863 | 0.00000 | 0.177 | | • | |
| 11 | 15863 | 16961 | -0.63400 | 0.196 | • | • | • |
| | | | | | | | |

ERROR: ON OBSERVATION 2, USE OF THE ABOVE PARAMETERS HAS RESULTED IN A DERIVATIVE OR RESIDUAL IN EXCESS OF 1E30. ITERATIONS TERMINATED.

| LOT | ХГ | XU | R | AUC | UCEP | DIF | PCT |
|-----|-------|-------|----------|-------|------|-----|-----|
| 1 | 0 | 200 | 1.00000 | 0.309 | | | • |
| 2 | 200 | 1100 | 3.50000 | 0.135 | • | • | |
| 3 | 1100 | 3700 | 1.88889 | 0.083 | • | • | |
| 4 | 3700 | 9429 | 1.20346 | 0.082 | • | • | |
| 5 | 9429 | 18429 | 0.57095 | 0.062 | • | • | |
| 6 | 18429 | 30429 | 0.33333 | 0.057 | • | • | • |
| 7 | 30429 | 42429 | 0.00000 | 0.055 | • | • | • |
| 8 | 42429 | 54429 | 0.00000 | 0.053 | • | • | • |
| 9 | 54429 | 60664 | -0.48042 | 0.057 | • | • | • |
| | | | | | | | |

----- SYS=AIM7F-R ------

ERROR: ON OBSERVATION 4, USE OF THE ABOVE PARAMETERS HAS RESULTED IN A DERIVATIVE OR RESIDUAL IN EXCESS OF 1E30. ITERATIONS TERMINATED.

| LOT | ХL | υx | R | AUC | UCP | DIF | PCT |
|-----|------|------|----------|-------|-----|-----|-----|
| 1 | 0 | 100 | 1.00000 | 0.741 | | | |
| 2 | 100 | 325 | 1.25000 | 0.378 | • | | |
| 3 | 325 | 925 | 1.66667 | 0.199 | • | | |
| 4 | 925 | 1725 | 0.33333 | 0.169 | | | |
| 5 | 1725 | 2825 | 0.37500 | 0.134 | | • | |
| 6 | 2825 | 4225 | 0.27273 | 0.116 | | • | |
| 7 | 4225 | 5125 | -0.35714 | 0.111 | | | |
| 8 | 5125 | 6269 | 0.27111 | 0.095 | | | |

----- SYS=AIM7F-GD -----

ERROR: ON OBSERVATION 6, USE OF THE ABOVE PARAMETERS HAS RESULTED IN A DERIVATIVE OR RESIDUAL IN EXCESS OF 1E30. ITERATIONS TERMINATED.

| LOT | XL | XU | R | AUC | UCE | DIF | PCT |
|-----|------|------|---------|-------|-----|-----|-----|
| 1 | 0 | 15 | 1.00000 | 1.551 | | • | |
| 2 | 15 | 85 | 3.66667 | 0.379 | • | | |
| 3 | 85 | 295 | 2.00000 | 0.228 | • | | |
| 4 | 295 | 505 | 0.00000 | 0.195 | • | | |
| 5 | 505 | 1255 | 2.57143 | 0.130 | | | |
| 6 | 1255 | 2565 | 0.74667 | 0.090 | | | |

C.8 - Modified Alternative Three Non-linear Regression

This section contains the summary results produced by the nonlinear regression procedure in SAS. The SAS program used to produce this run was discussed in Appendix B.8.

C.8.1 - Bomber Aircraft Programs

| | | | | | | < | YS≈B· | -10 | | | | | | |
|------|--------|-------|---------|---------|-------|------|-------|------|----------|-------|-------------|-------|-----------|-----|
| | | | | | | | 10-0 | 111 | | | | | | |
| NON- | LINEAF | R LEA | AST S | QUARES | SUM | MARY | STA | TIS' | rics | | DEPEN | DENT | VARIABLE | TCA |
| | | | | | | | | | | _ | | | | |
| | OURCE | | | | | SUM | | - | | | EAN S | | | |
| | EGRESS | | | | 4 | 59 | 46666 | | | 14 | 186666. | | | |
| | esidua | | | | 1 | | 1130 | 08.0 | 012 | | 1130 | 8.012 | } | |
| U | NCORRE | CIE | TOT | AL | 5 | 59 | 4779 | 76.8 | 310 | | | | | |
| | | | | | | | | | | | | | | |
| ((| CORREC | TED | TOTAL | ۲) | 4 | 17 | 23461 | L5.0 |)32 | | | | | |
| | | | | | | | | | | | | | | |
| P# | ARAMET | ER | E | STIMATE | | ASY | MPTO | ric | | | ASY | PTOT | 'IC 95 % | |
| | | | | | | STD | . ERF | ROR | | | CONFI | DENCE | INTERVAL | |
| | | | | | | | | | | | LOWER | | UPPER | • |
| Α | | | 420.3 | 3917395 | 3 | 9.24 | 21730 | 043 | -78 | | 11224 | 919 | .00279014 | |
| В | | | -0.3 | 3170991 | | | | | | | 41307 | | .09784302 | |
| С | | | | 0100323 | | | | | | | 26980 | | .20659160 | |
| D | | | | 0023587 | | 0.00 | | | | | 01814 | | .03728451 | |
| _ | | | • • • • | | | 0.00 | J | ,,,, | v | .0320 | 01014 | J | .03/20431 | - |
| I | COT | ΧL | ΧU | R | | Αt | JC | | UCP | | DIF | | PCT | |
| | | | | • • | | ••• | , | | - | | <i>D</i> 11 | | 101 | |
| | 1 | 0 | 1 | 1.00 | กกก | 5 | 35.8 | 6 | 508. | 748 | -72.9 | 148 | -13.615 | |
| | | 1 | 8 | 7.00 | | | 50.3 | | 260.4 | | -0.1 | | -0.061 | |
| | 2 3 | 8 | 18 | 1.42 | | | 00.5 | | 93.0 | | 7.4 | | 3.737 | |
| | | 18 | 52 | 3.40 | | | 42.0 | | 41.9 | | 0.0 | | 0.021 | |
| | 5 | 52 | 100 | 1.41 | | | 11.3 | _ | 11. | | | | | |
| | , | JL | 100 | 1.41 | τ , ο | Τ. | 11.3 | 1 | | /OI | -0.4 | 10T | -0.360 | |

| _ | | _ | | ~ |
|-----|-----|-----|------|---|
| - 5 | Υ.S | = 1 | I— 5 | |

| | | | 010 1 | L | | |
|--------------------------------------|--------|------------|---------------|----------------|----------------------------|--------------------------|
| NON-LINEAR LE | ast sq | uares sum | mary stati | STICS | DEPENDEN | T VARIABLE TCA |
| SOURCE | | DF | SUM OF SQU | ARES | MEAN SQUA | ARE |
| REGRESSION | Ī | 4 | 70010588 | .917 | 17502647.2 | 229 |
| REGRESSION RESIDUAL UNCORRECTE | | 6 | 2390182 | .993 | 398363.8 | 132 |
| UNCORRECTE | D TOTA | L 10 | 72400771 | .910 | | |
| 01.101.1201.2 | | | | | | |
| (CORRECTED | TOTAL |) 9 | 18070289 | | | |
| PARAMETER | ES | TIMATE | ASYMPTOTI | С | ASYMPT | OTIC 95 % |
| | | | STD. ERRO | R | CONFIDEN | ICE INTERVAL |
| | | | | | LOWER | UPPER |
| A | 125.5 | 056846 5 | 6.84193239 | 0 -13.58 | 1613802 2 | 64.59298299 |
| В | -0.2 | 192839 | 0.09031138 | 3 -0.44 | 0268029 | 0.00170028 0.13712513 |
| С | -0.0 | 293013 | 0.06801485 | 1 -0.19 | 5727795 | 0.13712513 |
| D | 0.0 | 014296 | 0.02077763 | 0 -0.04 | 9411425 | 0.05227071 |
| | | | | | | |
| LOT XL | ΔΩ | R | AUC | UCP | DIF | PCT |
| 1 0 | 20 | 1.00000 | 112.5 | 79.5062 | 32.994 | 29.328 |
| 2 20 | 63 | | 37.0 | 45.7277 | -8.728 -16.727 2.158 | -23.588 |
| 3 63 | 88 | 0.58140 | 28.6 | 45.3272 | -16.727 | -58.487 |
| 4 88 | 165 | 3.08000 | 32.3 | 30.1416 | 2.158 | 6.682 |
| 5 165 | 298 | 1 72727 | 23.4 | 29.6917 | -6.292 | -26.888 |
| 6 298 | 500 | 1 51880 | 28 4 | 26 4665 | 1.934 | 6.808 |
| 7 500 | 601 | 0.50000 | 27.3 | 28 7515 | -1.452 | -5.317 |
| 8 601 | 640 | 0.30000 | 27.3 | 28 5284 | | -4.500 |
| 9 640 | 702 | 1 58974 | 35.4 | 22 7719 | | 35.673 |
| 10 702 | 742 | 0.64516 | 35.0 | 26.2731 | 8.727 | |
| 10 /02 | 172 | 0.01310 | 33.0 | 20.2751 | 01,2, | 2 |
| | | | SYS=B-5 | 8 | | |
| NON-LINEAR LE | ast sq | uares sum | MARY STATI | STICS | DEPENDEN | T VARIABLE TCA |
| SOURCE | | חבי | STIM OF SOT | משמגו | MEAN SQUA | ag. |
| REGRESSION | r | <i>D</i> F | 1/238328 | 974 | 3559582.2 | 219 |
| | I | 71 | 14238328 0 | 000 | 0.0 | |
| UNCORRECTE | | | 14238328 | | 0.0 | 100 |
| UNCORRECTE | D IOIA | D 3 | 14230320 | .0/4 | | |
| (CORRECTED | TOTAL |) 3 | 1830393 | .074 | | |
| PARAMETER | E.C | TIMATE | ASYMPTOTI | C | ASYMPT | OTIC 95 % |
| r entention (c) | 20 | | STD. ERRO | | | CE INTERVAL |
| | | | | - - | LOWER | UPPER |
| A | 153.3 | 118110 | | 0 153.3 | | 53.31181104 |
| В | | 019116 | | | 0191164 | 0.10191164 |
| C | | 367487 | | | 3674867 | -0.63674867 |
| D | | 367006 | | | 3670062 | 0.23670062 |
| 5 | V.2 | , | | | | |

| LOT | ХL | χυ | R | AUC | UCP | DIF | PCT |
|-----|----|-----|---------|-------|-------|--------------|--------------|
| 1 | 0 | 17 | 1.00000 | 93.86 | 93.86 | 0 | 0 |
| 2 | 17 | 53 | 2.11765 | 80.26 | 80.26 | 0 | 0 |
| 3 | 53 | 73 | 0.55556 | 73.16 | 73.16 | -1.77636E-15 | -2.42804E-15 |
| 4 | 73 | 103 | 1.50000 | 36.56 | 36.56 | 1.77636E-15 | 4.85874E-15 |

C.8.2 - Fighter Aircraft Programs

| <u> </u> | | | | | VC X - 1 | 0 | | ~~~~~ |
|----------|------------|---------|--------|-------|----------|----------|-----------------------------------|--|
| NON-LINE | | | | | | | | NT VARIABLE TCA |
| SOURC | E | | DI | F SUM | OF SQU | ARES | MEAN SQU | ARE |
| REGRE | ESSION | | | 4 51 | 68879. | 5108 | 1292219.8 | 777 |
| RESI | UAL | | ! | 5 | 18337. | 8736 | 3667.5 | 747 |
| UNCOF | RECTE | D TOTAL | , ! | 9 51 | 87217. | 3844 | MEAN SQU 1292219.8 3667.5 | |
| (CORF | ECTED | TOTAL) | | 8 12 | 26666. | 3049 | | |
| PARAN | ETER | EST | IMATE | ASY | MPTOTI | С | ASYMP | TOTIC 95 % NCE INTERVAL |
| | | | | STD | . ERRO | R | CONFIDE | NCE INTERVAL |
| | | | | | | | LOWER | UPPER 25.959884415 |
| A | | 15.711 | 80805 | 3.986 | 733572 | 5 5.463 | 7316781 | 25.959884415 |
| В | | -0.049 | 25741 | 0.038 | 169904 | 8 -0.147 | 3748550 | 0.048860029 |
| C | | | | | | | | -0.006757144 |
| D | | 0.011 | 37569 | 0.004 | 231151 | 2 0.000 | 4993263 | 0.022252052 |
| LOT | ΧŢ | υx | R | A | UC | UCP | DIF | PCT |
| 1 | 0 | 22 | 1.0000 | 00 1 | 2.37 | 12.5406 | -0.170 | PCT 6 -1.379 |
| 2 | 22 | 75 | 2.4090 | 9 9 | 9.16 | 8,5510 | 0.609 | 0 6.648 |
| 3 | 75 | 95 | 0.3773 | 36 | 8.20 | 11.2503 | -3.050 | 3 -37.198 |
| 4 | | | | | | | | 5 -0.420 |
| 5 | 195 | 339 | 1 4400 | າດ ' | 7 82 | 7 5730 | 0.247 | n 3 158 |
| 6 | 339 | 483 | 1.0000 | 00 . | 7.59 | 8.0608 | -0.470 | 8 -6,203 |
| 7 | 483 | 627 | 1.0000 | 00 ' | 7.82 | 7.7943 | 0.025 | 7 0.329 |
| 8 | 627 | 687 | 0.4166 | 57 10 | 0.18 | 9.4882 | 0.691 | 8 6.796 |
| 9 | 687 | 707 | 0.3333 | 33 13 | 3.64 | 9.7831 | 3,856 | 8 -6.203 7 0.329 8 6.796 9 28.276 |
| | | | | SYS | S=F-10 | 0 | | |
| NON-LINE | AR LEA | | | | | | | NT VARIABLE TCA |
| 001 P00 | ro. | | ~- | | | | | |
| SOURC | e Ssion | | DF | SUM | JE SQU | AKES | MEAN SQUA 2954597.1 17252.1 | AKE |
| | | | 4 | . TTS | 140E3 | .08/ | 295459/ | 1/2 |
| RESID | UAL | TOTAL | 1 | | 17252 | .187 | 1/252. | L8∠ |
| UNCOR | RECTEL | TOTAL | Ş |) TT | 33564Ú | . 869 | | |

(CORRECTED TOTAL) 4 2086478.767

| PARAMETER | ESTIMAT | STD. ERRO | R CO | ASYMPTOTION NFIDENCE | INTERVAL |
|---|---|--|--|---|---|
| A B C D | 14.7508097 -0.1103894 -0.1199321 0.0047786 | 4 0.11589551 | 3 -117.56137 8 -1.58295 6 -1.78370 2 -0.06218 | 7779 147. 7789 1. 1494 1. 811 0. | 06299725 36217900 54384058 07174538 |
| | 568 2 1161 1720 2277 | 3.6957 3.45 1.0881 3.08 0.9427 3.10 0.9964 2.50 SYS=F-10 | 3.45000 3.02404 3.00062 2.66722 | DIF -2.8805 -0.0000 0.0560 0.0994 -0.1672 | -0.000 1.817 3.206 -6.689 |
| NON-LINEAR LES SOURCE REGRESSION RESIDUAL UNCORRECTED (CORRECTED | O TOTAL | DF SUM OF SQU 4 7063772. 2 13086. 6 7076859. 5 2200718. | ARES MEA 8462 1765 9984 6 8446 | | ARIABLE TCA |
| PARAMETER | ESTIMAT | | С | ASYMPTOTI | C 95 % |
| | | STD. ERRO | | NFIDENCE WER | |
| A B C D | 28.7327527 -0.2147499 -0.0764171 0.0175129 | 6 7.158379123 9 0.039209078 5 0.056880834 | LO | WER 922 59.5 935 -0.0 156 0.1 | UPPER 33110613 46045089 58324014 |
| A B C D LOT XL 1 0 2 31 3 115 4 424 5 630 6 714 | -0.2147499 -0.0764171 0.0175129 XU R 31 1.0 115 2.7 424 3.6 630 0.6 714 0.4 807 1.1 | 6 7.158379123 9 0.039209078 5 0.056880834 2 0.012911313 AUC 0000 16.85 0968 7.58 7857 6.91 6667 5.76 0777 5.27 0714 5.22 | LO 1 -2.0676050 5 -0.3834548 1 -0.3211583 2 -0.0380405 UCP 15.4567 8.3628 - 6.8862 5.7187 5.9077 - 4.5483 | WER 922 59.5 935 -0.0 156 0.1 836 0.0 DIF 1.39332 0.78281 0.02379 0.04126 0.63767 0.67168 | UPPER 33110613 46045089 68324014 73066431 PCT 8.269 -10.327 0.344 0.716 -12.100 12.868 |
| A B C D LOT XL 1 0 2 31 3 115 4 424 5 630 6 714 | -0.2147499 -0.0764171 0.0175129 XU R 31 1.0 115 2.7 424 3.6 630 0.6 714 0.4 807 1.1 | 6 7.158379123 9 0.039209078 5 0.056880834 2 0.012911313 AUC 0000 16.85 0968 7.58 7857 6.91 6667 5.76 0777 5.27 | LO 1 -2.0676050 5 -0.3834548 1 -0.3211583 2 -0.0380405 UCP 15.4567 8.3628 - 6.8862 5.7187 5.9077 - 4.5483 | WER 922 59.5 935 -0.0 156 0.16 836 0.0 DIF 1.39332 0.78281 0.02379 0.04126 0.63767 0.67168 | UPPER 33110613 46045089 68324014 73066431 PCT 8.269 -10.327 0.344 0.716 -12.100 12.868 |
| A B C D LOT XL 1 0 2 31 3 115 4 424 5 630 6 714 NON-LINEAR LEA | -0.2147499 -0.0764171 0.0175129 XU R 31 1.0 115 2.7 424 3.6 630 0.6 714 0.4 807 1.1 AST SQUARES | 6 7.158379123 9 0.039209078 5 0.056880834 2 0.012911313 AUC 0000 16.85 0968 7.58 7857 6.91 6667 5.76 0777 5.27 0714 5.22 SYS=F-10 SUMMARY STATI | LO 1 -2.0676050 5 -0.3834548 1 -0.3211583 2 -0.0380405 UCP 15.4567 8.3628 - 6.8862 5.7187 5.9077 - 4.5483 2 STICS DE ARES MEA 4660 1115 | WER 922 59.5 935 -0.0 156 0.1 836 0.0 DIF 1.39332 0.78281 0.02379 0.04126 0.63767 0.67168 PENDENT V | UPPER 33110613 46045089 68324014 73066431 PCT 8.269 -10.327 0.344 0.716 -12.100 12.868 |

| AAC | AMETE | R | ESTIMATE | | MPTOTIC . ERROR | CONE | SYMPTOTIC 95 % FIDENCE INTERVAL |
|---|---------------------------------------|--|---|--|---|--|--|
| A B C | | -0 | .37248470 .38590304 .01258317 | } | 0 0 0 | -0.38590304 | ER UPPER 97 29.372484697 10 -0.385903040 74 -0.012583174 |
| D | | | .00343420 | | 0 | | |
| LOT | ХĽ | ΧU | R | AUC | UCP | DIF | PCT |
| 1 | 0 | | 1.00000 | 11.66 | | | -3.80866E-15 |
| 2 | 37 | | 2.91892 | 5.17 | 5.17 | 3.33067E-16 | 6.44230E-15 |
| 3 | 145 | | 5.20370 | 3.50 | 3.50 | 1.66533E-16 | 4.75810E-15 -7.28427E-14 |
| 4 | 707 | 847 | 0.24911 | 2.21 | 2.21 | -1.60982E-15 | 5 -7.28427E-14 |
| | | | | SY | S=F-106 | ~~~~~~~ | |
| NON-LI | NEAR I | LEAST | SQUARES | SUMMARY | STATIS | TICS DEPE | NDENT VARIABLE TCA |
| SOU | RCE | | | DF SUM | OF SQUA | res mean | SOUARE |
| | RESSI | ОМ | | 4 47 | | | 39.7183 |
| RES | IDUAL | | | | | | 0.0000 |
| UNO | ORREC | TED TO | CTAL | 0 4 47 | 65078.8 | 733 | |
| (00) | RRECT | ED TO | ral) | 3 4 | 80903.3 | 427 | |
| PAR | AMETE | - | ESTIMATE | ACV | MPTOTIC | λC | YMPTOTIC 95 % |
| | | X | ESTIMATE | | ERROR | CONF | IDENCE INTERVAL |
| | | | | STD | . ERROR | CONF | IDENCE INTERVAL R UPPER |
| A | | 107 | 7.9899447 | STD | . ERROR 0 | CONF LOWE 107.9899447 | IDENCE INTERVAL R UPPER 3 107.98994473 |
| | | 107 | | STD | ERROR 0 0 | CONF LOWE 107.9899447 -0.3855099 | TIDENCE INTERVAL R UPPER 3 107.98994473 4 -0.38550994 |
| A B | | 107 -(| 7.9899447 3.3855099 | STD | . ERROR 0 | CONF LOWE 107.9899447 -0.3855099 -0.1277521 | IDENCE INTERVAL R UPPER 3 107.98994473 |
| A B C D | | 107 | 7.9899447 0.3855099 0.1277521 0.0277680 | STD | . ERROR 0 0 0 | CONF LOWE 107.9899447 -0.3855099 -0.1277521 0.0277679 | TIDENCE INTERVAL R UPPER 3 107.98994473 4 -0.38550994 3 -0.12775213 5 0.02776795 |
| A B C D | ХL | 107 -(-(XU | 7.9899447 0.3855099 0.1277521 0.0277680 R | STD | . ERROR 0 0 0 0 UCP | CONF LOWE 107.9899447 -0.3855099 -0.1277521 0.0277679 | TIDENCE INTERVAL R UPPER 3 107.98994473 4 -0.38550994 3 -0.12775213 5 0.02776795 PCT |
| A B C D LOT | | 107 | 7.9899447 0.3855099 0.1277521 0.0277680 R 1.00000 | AUC 34.19 | . ERROR 0 0 0 0 0 UCP 34.19 | CONF LOWE 107.9899447 -0.3855099 -0.1277521 0.0277679 DIF | TIDENCE INTERVAL R UPPER 3 107.98994473 4 -0.38550994 3 -0.12775213 5 0.02776795 PCT 0 |
| A B C D | XL 0 | 107 -(-(XU 42 | 7.9899447 0.3855099 0.1277521 0.0277680 R | AUC 34.19 10.54 | . ERROR 0 0 0 0 UCP 34.19 | CONF LOWE 107.9899447 -0.3855099 -0.1277521 0.0277679 DIF | PIDENCE INTERVAL R UPPER 3 107.98994473 4 -0.38550994 3 -0.12775213 5 0.02776795 PCT 0 1.47468E-14 |
| A B C D LOT 1 2 | XL 0 42 130 | 107 -(XU 42 130 175 | 7.9899447 0.3855099 0.1277521 0.0277680 R 1.00000 2.09524 0.51136 | AUC 34.19 10.54 11.64 | . ERROR 0 0 0 0 UCP 34.19 10.54 11.64 | CONF LOWE 107.9899447 -0.3855099 -0.1277521 0.0277679 DIF 0 1.55431E-15 1.55431E-15 | PIDENCE INTERVAL R UPPER 3 107.98994473 4 -0.38550994 3 -0.12775213 5 0.02776795 PCT 0 1.47468E-14 |
| A B C D LOT 1 2 3 4 | XL 0 42 130 175 | 107 -(XU 42 130 175 340 | 7.9899447 0.3855099 0.1277521 0.0277680 R 1.00000 2.09524 0.51136 3.66667 | AUC 34.19 10.54 11.64 7.59 | . ERROR 0 0 0 0 UCP 34.19 10.54 11.64 7.59 | CONF LOWE 107.9899447 -0.3855099 -0.1277521 0.0277679 DIF 0 1.55431E-15 1.55431E-15 3.33067E-16 | PIDENCE INTERVAL R UPPER 3 107.98994473 4 -0.38550994 3 -0.12775213 5 0.02776795 PCT 0 1.47468E-14 1.33532E-14 |
| A B C D LOT 1 2 3 4 | XL 0 42 130 175 | 107 -(-(XU 42 130 175 340 | 7.9899447 0.3855099 0.1277521 0.0277680 R 1.00000 2.09524 0.51136 3.66667 | AUC 34.19 10.54 11.64 7.59 | . ERROR 0 0 0 0 0 UCP 34.19 10.54 11.64 7.59 S=F-15AE | CONF LOWE 107.9899447 -0.3855099 -0.1277521 0.0277679 DIF 0 1.55431E-15 1.55431E-15 3.33067E-16 | PIDENCE INTERVAL R UPPER 3 107.98994473 4 -0.38550994 3 -0.12775213 5 0.02776795 PCT 0 1.47468E-14 1.33532E-14 4.38823E-15 |
| A B C D LOT 1 2 3 4 | XL 0 42 130 175 | 107 -(-(XU 42 130 175 340 | 7.9899447 0.3855099 0.1277521 0.0277680 R 1.00000 2.09524 0.51136 3.66667 | AUC 34.19 10.54 11.64 7.59 | . ERROR 0 0 0 0 UCP 34.19 10.54 11.64 7.59 S=F-15AE STATIST | CONF LOWE 107.9899447 -0.3855099 -0.1277521 0.0277679 DIF 0 1.55431E-15 1.55431E-15 3.33067E-16 | PIDENCE INTERVAL R UPPER 3 107.98994473 4 -0.38550994 3 -0.12775213 5 0.02776795 PCT 0 1.47468E-14 1.33532E-14 4.38823E-15 NDENT VARIABLE TCA |
| A B C D LOT 1 2 3 4 NON-LIN SOUR | XL 0 42 130 175 | 107 -(XU 42 130 175 340 | 7.9899447 0.3855099 0.1277521 0.0277680 R 1.00000 2.09524 0.51136 3.66667 | AUC 34.19 10.54 11.64 7.59 SYS | . ERROR 0 0 0 0 UCP 34.19 10.54 11.64 7.59 S=F-15AE STATIST | CONF LOWE 107.9899447 -0.3855099 -0.1277521 0.0277679 DIF 0 1.55431E-15 1.55431E-15 3.33067E-16 | TIDENCE INTERVAL R UPPER 3 107.98994473 4 -0.38550994 3 -0.12775213 5 0.02776795 PCT 0 1.47468E-14 1.33532E-14 4.38823E-15 NDENT VARIABLE TCA |
| A B C D LOT 1 2 3 4 NON-LIN SOUR | XL 0 42 130 175 VEAR L | 107 -(XU 42 130 175 340 | 7.9899447 0.3855099 0.1277521 0.0277680 R 1.00000 2.09524 0.51136 3.66667 | AUC 34.19 10.54 11.64 7.59 SYS SUMMARY DF SUM (| . ERROR 0 0 0 0 0 UCP 34.19 10.54 11.64 7.59 E=F-15AE STATIST OF SQUAR 242273.3 | CONF LOWE 107.9899447 -0.3855099 -0.1277521 0.0277679 DIF 0 1.55431E-15 1.55431E-15 3.33067E-16 3 | TIDENCE INTERVAL R UPPER 3 107.98994473 4 -0.38550994 3 -0.12775213 5 0.02776795 PCT 0 1.47468E-14 1.33532E-14 4.38823E-15 NDENT VARIABLE TCA SQUARE 68.333 |
| A B C D LOT 1 2 3 4 NON-LIN SOUR | XL 0 42 130 175 VEAR L | 107 -(XU 42 130 175 340 | 7.9899447 0.3855099 0.1277521 0.0277680 R 1.00000 2.09524 0.51136 3.66667 | AUC 34.19 10.54 11.64 7.59 SYS SUMMARY DF SUM (| . ERROR 0 0 0 0 0 UCP 34.19 10.54 11.64 7.59 E=F-15AE STATIST OF SQUAR 242273.3 | CONF LOWE 107.9899447 -0.3855099 -0.1277521 0.0277679 DIF 0 1.55431E-15 1.55431E-15 3.33067E-16 3 | TIDENCE INTERVAL R UPPER 3 107.98994473 4 -0.38550994 3 -0.12775213 5 0.02776795 PCT 0 1.47468E-14 1.33532E-14 4.38823E-15 NDENT VARIABLE TCA |

| PARA | METER | ES | TIMATE | ASYMPTOTICSTD. ERRO | | ASYMPTOT CONFIDENCE | INTERVAL |
|----------------------------|-------------------------------------|---------------------------------------|--|--|--|--|--|
| A B C D | | -0.13 0.00 | 217983 511343 | 3.508772563 0.029192175 0.020895969 0.003607697 | 2 -0.2577 2 -0.0847 | 784999 -0. 795658 0. | |
| LOT | ХL | XU | R | AUC | UCP | DIF | PCT |
| 1 2 3 4 5 6 | 0 30 92 164 272 296 | 30 92 164 272 296 404 | 1.00000 2.06667 1.16129 1.50000 0.22222 4.50000 | 25.597 19.556 17.183 17.126 16.021 16.272 | 24.5132 19.9511 17.8575 16.7910 15.7434 16.2683 | 1.08383 -0.39512 -0.67446 0.33496 0.27764 0.00374 | 4.2342 -2.0205 -3.9252 1.9558 1.7330 0.0230 |
| | | | | SYS=F-150 | CD | | |
| NON-LIN | EAR LE | AST SQ | uares sui | MARY STATIS | STICS | DEPENDENT ' | VARIABLE TCA |
| RESII UNCO | ESSION DUAL RRECTE | d total | 4 4 L 8 | SUM OF SQUI 8383640.3 35208.3 8418849.3 | 2339 20 9123 1462 | EAN SQUARE 195910.0585 8802.2281 | |
| PARAM | ÆTER | ES' | rimate | ASYMPTOTIC | र | ASYMPTOT: CONFIDENCE | INTERVAL |
| A B C D | | -0.223 0.528 | 344210 (346678 (| 2.6059631246 0.195688155 0.427482822 0.2070370306 | 5 5.34507 3 -0.76675 L -0.65839 | 21718 0.3 97503 1.7 | |
| LOT | ХГ | ΧU | R | AUC | UCP | DIF | PCT |
| 1 2 3 4 5 6 | 0 97 175 235 277 313 | 97 175 235 277 313 352 | 1.00000 0.80412 0.76923 0.70000 0.85714 1.08333 | 2 15.588 3 15.508 17.665 4 19.943 | 16.9172 16.6559 16.5086 15.4607 18.2735 20.8823 | 0.3318 -1.0679 -1.0006 2.2043 1.6695 -1.5743 | 1.9236 -6.8508 -6.4522 12.4785 8.3715 -8.1537 |
| 7 8 | 352 388 | 388 436 | 0.92308 1.33333 | 3 21.954 | 19.5223 20.9404 | 2.4317 0.0766 | 11.0763 0.3643 |

| | | _ | | | | DEPENDENT | VARIABLE TCA |
|-------------|--|---|--------------------------------------|--|---|---|-------------------------------------|
| ; ; ; | SOURCE RECRESSION RESIDUAL UNCORRECTE | D TOTAL | DF SU 4 2 6 | M OF SQU 14001335 31440 14032776 | ARES .938 .598 | MEAN SQUARE 3500333.985 15720.299 | 5 |
| | | TOTAL) | | | | | |
| i | PARAMETER | ESTIMA | TE A | SYMPTOTI TD. ERRO | C R | ASYMPTON CONFIDENCE LOWER | PIC 95 % E INTERVAL UPPER |
| : | A B C D | 24.453023 -0.585489 0.911183 -0.389710 | 41 5.2 71 1.1 63 2.0 56 0.8 | 66169648 36722797 14143032 67184364 | 9 1.7942 4 -5.4764 1 -7.7550 2 -4.1209 | 2752589 47. 4668911 4. 6695980 9. 4447252 3. | 111771555 |
| | 1 0 | 60 1.0 | 0000 | AUC 20.544 19.203 | 20.1017 | DIF 0.44228 0.00000 | 2.1529 |
| ; | 3 132 4 228 | 228 1.3 324 1.0 | 3333 0000 | 17.608 16.175 | 17.6080 17.0696 | -0.00000 -0.89464 | -0.0000 -5.5310 |
| | | 420 1.0 516 1.0 | | | | -0.70294 1.42850 | |
| NON- | -LINEAR LE | | | | | DEPENDENT | VARIABLE TCA |
| | SOURCE | | | | | MEAN SQUARE | |
| F | REGRESSION | | 4 ! | 5506165.: | 2105 1 | 376541.3026 | |
| Į | RESIDUAL INCORRECTE | TOTAL | 1 5 9 | 71871. 5578036. | 5295 7400 | 71871.5295 | |
| (| CORRECTED | TOTAL) | 4 | 338023. | 5480 | | |
| E | ARAMETER | ESTIMAT | | SYMPTOTION TO ERROR | | ASYMPTOT CONFIDENCE LOWER | |
| A E | 3 | 20.6134884 -0.2748417 0.0763487 | 74 0.4 | 374621863 463715153 379571876 | | 845695 177 680644 5 | .84543382 .61712297 .25218899 |
| Ľ | | -0.0035854 | | 10067668 | | | .20673438 |
| | OT XL 1 0 | | 0000 | AUC 10.14 | UCP 10.0868 | DIF 0.05322 | PCT 0.525 |
| | 2 105 3 250 | | 18095 10690 | 7.74 8.04 | 8.3252 6.9207 | -0.58520 1.11928 | -7.561 13.921 |
| | 4 425 | 605 1.0 | 2857 | 5.05 | 5.9162 | -0.86619 | -17.152 |
| | 5 605 | 725 0.6 | 6667 | 5.13 | 4.7607 | 0.36935 | 7.200 |

| | | | | SYS=F-16E | | | |
|---------|----------|----------|-----------|-------------|---------|-------------|--------------|
| NON-LIN | VEAR LE | AST SQUA | RES SUMM | ARY STATIS | TICS | DEPENDENT | VARIABLE TCA |
| SOUR | RCE | | DF S | UM OF SQUA | | MEAN SQUAR | |
| | RESSION | | 4 | 47698330. | | 1924582.60 | |
| | DUAL | | 6 | | | 53085.86 | 7 |
| UNCC | PRECTE | D TOTAL | 10 | 48016845. | 623 | | |
| (COF | RECTED | TOTAL) | 9 | 1747028. | 765 | | |
| | METER | | | ASYMPTOTIC | | ASYMPTO | TIC 95 % |
| | | | | STD. ERROR | | CONFIDENCI | |
| | | | | | | LOWER | UPPER |
| A | | 11.5304 | 7455 3. | 8707457009 | 2.0590 | 941839 21 | .001854913 |
| В | | -0.2620 | 8935 0. | 8643464471 | -2.3770 | 704412 1 | .852891742 |
| С | | 0.4134 | 5526 1. | 5024837872 | -3.2629 | 927777 4 | .089903299 |
| D | | -0.1586 | 6546 0. | 5149134821 | -1,6633 | 056334 1 | . 345974712 |
| LOT | ХL | χυ | R | AUC | UCP | DIF | PCT |
| 1 | 0 | 120 | 1.00000 | 9.86 | 11.2164 | -1.3564 | -13.756 |
| 2 | 120 | 264 | 1.20000 | 10.58 | 11.8721 | -1.2921 | -12.212 |
| 3 | 264 | 414 | 1.04167 | 14.55 | 11.2935 | 3.2565 | 22.382 |
| 4 | 414 | 630 | 1.44000 | 11,93 | 11.8429 | 0.0871 | 0.730 |
| 5 | 630 | 846 | 1.00000 | 11.28 | 10.9881 | 0.2919 | 2.588 |
| 6 | 846 | 1062 | 1.00000 | 11.02 | 10.9674 | 0.0526 | 0.477 |
| 7 | 1062 | 1278 | 1.00000 | 10.88 | 10.9510 | -0.0710 | -0.653 |
| 8 | 1278 | 1494 | 1.00000 | 10.69 | 10.9375 | -0.2475 | -2.315 |
| 9 | 1494 | 1710 | 1.00000 | 10.61 | 10.9259 | -0.3159 | -2.977 |
| 10 | 1710 | 1926 | 1.00000 | 10.54 | 10.9158 | -0.3758 | -3.565 |
| C.8.3 - | Electro | onics Pr | oqrams | | | | |
| | | | | | | | |
| | | | : | 512=ARC-10 | JV | | |
| NON-LIN | IEAR LE | AST SQUA | res summi | ARY STATIST | rics | DEPENDENT | VARIABLE TCA |
| SOUF | CE | | DF S | JM OF SQUAR | RES | MEAN SQUARI | C |
| | ESSION | | | 66.7271564 | | 6.681789116 | |
| | יועו זען | | | 0 016917 | | 0 01691726 | |

| | | - SYS=ARC-10 | 19V | |
|------------------|--------------|--------------|-------------|--------------------|
| NON-LINEAR LEAST | SQUARES SUN | MARY STATIS | TICS DEPE | NDENT VARIABLE TCA |
| SOURCE | DF | SUM OF SQUA | res means | QUARE |
| RECRESSION | 4 | 66.727156 | | |
| RESIDUAL | 1 | 0.016917 | 268 0.0169 | 317268 |
| UNCORRECTED TO | OTAL 5 | 66.744073 | 730 | |
| (CORRECTED TOT | CAL) 4 | 29.010182 | 832 | |
| PARAMETER | ESTIMATE | ASYMPTOTIC | : AS | MPTOTIC 95 % |
| | | STD. ERROR | CONF | DENCE INTERVAL |
| | | | LOWER | UPPER |
| A 0.01 | .59605141 0. | .00586251125 | 05852855384 | 0.09044958197 |
| в 0.11 | .84559828 0. | .06575925142 | 71708106568 | 0.95399303137 |
| C02 | 75524341 0. | .01453107962 | 21218433170 | 0.15707946354 |
| D 0.01 | .05163011 0. | .00482914855 | 05084286029 | 0.07187546256 |

| 1 | LOT | ХГ | ΧU | R | 1 | AUC | UC | P | DIF | PCT |
|--|-----------------------|----------------------------|--|--|-----------------------|--|--------------------------------------|-------------------------|--|--|
| | 1 2 3 4 5 | 0 4 28 107 333 | 4 28 107 333 441 | 1.00000 6.00000 3.29167 2.86076 0.47788 |) (; (| 0.0487 0.0393 0.0285 0.0313 0.0303 | 0.03 0.02 0.03 | 90682 8 7 686 | 0.0000238 | 0.5898 -0.9425 0.0759 |
| | | | | | | SYS≈ | ARC-5 | 4 | | |
| NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE T | | | | | | | | | | |
| SOURCE DF SUM OF SQUARES REGRESSION 4 4663.5182872 RESIDUAL 3 2.6826555 UNCORRECTED TOTAL 7 4666.2009427 | | | | | | | | | MEAN SQUAR 1165.879571 0.894218 | 8 |
| (| (CORF | RECTE | D TOTA | L) | 6 | 1109 | 4069 | 615 | | |
| E | PARAN | ŒTER | E | esti mate | , | ASYMP1 | | | ASYMPTO CONFIDENC LOWER | |
| I C | A 3 2 0 | | 110 0.003 | 0038840 32297260 | 0. | .0161398 .010248 | 80148 88274 | 1613 0293 | 73979678 0.0 868802250 88638854 0.0 23918453 0.0 | 5419442855 5863896581 3584584060 |
| LOI | | ХL | VV | R | | AUC | U | æ | DIF | PCT |
| 1 2 3 4 5 6 7 | 17 31 42 45 | 94 | 900 1753 3134 4294 4594 7697 10347 | 1.000 0.947 1.619 0.840 0.258 10.343 0.854 | 8 0 0 6 3 | 0.0210 0.0165 0.0164 0.0145 0.0144 0.0139 0.0143 | 0.01 0.03 0.03 0.03 0.01 | 138999 140814 | -0.0008637 -0.0000541 -0.0009872 -0.0005745 0.00000000 | 1 -5.2346 1 -0.3299 3 -6.8085 2 -3.9897 9 0.0006 |
| | | | | | | - SYS=A | SN-63 | } | | |
| NON- | LINE | AR LI | east s | QUARES | SUM | mary st | ATIST | rics | DEPENDENT | VARIABLE TCA |
| R R U | ESID NCOR | SSION WAL RECTE | ED TOT. | | 4 6 10 | SUM OF 27727 14 27741 14794 | .7045 .2604 .9649 | 613 183 196 | MEAN SQUARE 6931.926128 2.376747 | 3 |
| P | ARAM | ETER | E | STIMATE | | ASYMPT STD. E | | | ASYMPTOT CONFIDENCE LOWER | |

```
0.1473430711 0.01848939300 0.10210112360 0.19258501862
   Α
   В
            0.0110769420 0.01874353687 -.03478687362 0.05694075761
   C
            0.0542800582 0.02007166477 0.00516642831 0.10339368800
   D
            -.0237623145 0.00844562143 -.04442802058 -.00309660840
  LOT
         XL
               XU
                    R
                           AUC
                                    UCP
                                              DIF
   1
         0
             781 1.00000 0.1866 0.186616
                                          -0.000016 -0.0088
   2
       781
             930
                 0.19078 0.1744 0.169289
                                           0.005111
                                                      2.9309
                 1.92617 0.1769 0.178462
   3
       930
           1217
                                          -0.001562 -0.8829
      1217
           1358
                 0.49129 0.1817 0.185294 -0.003594
                                                     -1.9782
      1358
            1450
                 0.65248 0.1772 0.191787
                                           -0.014587
                                                     -8.2321
   6
      1450
           1585
                 1.46739 0.2189 0.196867
                                           0.022033
                                                     10.0652
      1585
           1693
                 0.80000 0.1911 0.197078
                                           -0.005978
                                                     -3.1281
   8 1693 1851
                 1.46296
                                 0.198179
                         0.1917
                                           -0.006479
                                                     -3.3798
   9
      1851
           1887
                 0.22785 0.2005
                                 0.174179
                                           0.026321 13.1278
   10 1887 1923 1.00000 0.2145 0.201723
                                          0.012777
                                                       5.9566
              NON-LINEAR LEAST SQUARES SUMMARY STATISTICS
                                            DEPENDENT VARIABLE TCA
                       DF SUM OF SQUARES
  SOURCE
                                            MEAN SQUARE
  REGRESSION
                        4
                            119.44605374
                                            29.86151344
  RESIDUAL
                        4
                             0.00994507
                                             0.00248627
  UNCORRECTED TOTAL
                        8
                            119.45599881
  (CORRECTED TOTAL)
                        7 64.18968336
  PARAMETER
                ESTIMATE
                           ASYMPTOTIC
                                               ASYMPTOTIC 95 %
                           STD. ERROR
                                             CONFIDENCE INTERVAL
                                             LOWER
                                                          UPPER
            0.0322894109 0.00190455419 0.02700159230 0.03757722951
  Α
  В
            0.0003491408 0.00729291290 -.01989895755 0.02059723918
            0.0350827560 0.02223282003 -.02664461317 0.09681012510
  C
  D
            -.0155475768 0.01043692524 -.04452473468 0.01342958113
                        AUC
 LOT
       XL XU
                 R
                                 UCP
                                                         PCT
                                                 DIF
        0 152 1.00000 0.0350 0.0349860
                                            0.00001405
                                                         0.0401
   1
       152
           402
                        0.0353
   2
                1.64474
                               0.0353080
                                           -0.00000804
                                                       -0.0228
       402
           483
                0.32400
                        0.0342
                               0.0343348
                                           -0.00013484
                                                       -0.3943
       483 541
                 0.71605 0.0356
                                0.0360134
                                                        -1.1613
                                           -0.00041341
       541
            567
                 0.44828 0.0370
                                0.0350423
                                            0.00195771
                                                        5.2911
            575
   6
       567
                0.30769 0.0399
                                0.0343338
                                            0.00556620
                                                       13.9504
   7
       575 583 1.00000 0.0370 0.0366433
                                            0.00035675
                                                       0.9642
       583 594 1.37500 0.0427 0.0364939 0.00620608 14.5341
```

| SIG-TAIN 99 | | | | | | | | | | | | |
|--------------------|-------------------------|-----------------------------------|------------------------------|--------------------------|--------------------------|-----------------------------|------------------------------|------------------|--------------------------------------|-------------------------|---------------------------|-----|
| NON-L | INEAR | LEAST S | QUARES | SUI | MARY | STAT | CISTIC | cs | DEPEN | DENT | VARIABLE | TCA |
| | URCE | ON | | DF 4 | | OF SC | | | MEAN S | | | |
| RE DE | GRESSI | OIN | | 4 | 31 | 5.804 | 10190. 15001 : |) † | 1.451 | | | |
| IN | ICUBBEC. | TED TOI | יאר. | я Я | 38 | 3.609 | 13301. 16091. | L 4 | 1.401 | 14/J |) | |
| OI. | CORUEC | 1130 101 | AU | Ū | 50 | 3.00 | ,0071- | 1 | | | | |
| | | ED TOTA | | | | | | 5 | | | | |
| PAR | AMETER | ES | TIMATE | | | PTOTI | | | ASYM | | | |
| | | | | | STD | . ERF | KOK | | LOWER | | INTERVAL UPPER | |
| A | | 0 042 | 256817 | 1 0 | 0216 | 63097 | nn - | 0179 | | | 0240240291 | - |
| В | | | | | | | | | | | 889542235 | |
| č | | | | | | | | | | | 552297704 | |
| D | | | | | | | | | | | 425699062 | |
| | | | | | | | | | - | | - | |
| LO | | | R | | AUC | | UCP | | | DIF | | |
| 1 | | | 1.000 | | 0.04 | | | | | | 9.441 | |
| 2 | | | 1.248 | | 0.04 | | .0446 | | | | | |
| 3 4 | | | 0.943 | | 0.04 | | .0412 | | 0.000 | | 0.155 | |
| 5 | | 781 805 | 1.313 | | 0.04 | | .0459 | | | | -6.014 45.827 | |
| 6 | | | 3.000 | | 0.06 | | .0694 | | | | -11.265 | |
| 7 | | | 0.777 | | 0.06 | | | | | | 38.655 | |
| 8 | | | 2.089 | | 0.06 | | | | 0.011 | | | |
| | | | | | | | | | | | | |
| | | | | | SYS | =ASN- | 108 - | | | | | |
| | | | | | | | . . | | | | | |
| NON-L | INEAR L | LEAST S | | | | STAT | ISTIC | :S | DEPENI | DENT | VARIABLE | TCA |
| SO | URCE | | | DF 4 1 | SUM | OF SQ | LIARES | : | MEAN S | א וא | | |
| | GRESSIC | ÒΝ | | 4 | 56 | 0.447 | | | 140.1119 | | | |
| | SIDUAL | | | 1 | | 0.182 | | | 0.1827 | | | |
| UN | CORRECT | TED TOT | AL | 5 | 56 | 0.630 | 59524 | ļ | | | | |
| (0 | ORRECTE | ED TOTA | L) | 4 | 22 | 6.667 | 10333 | } | | | | |
| | | | | | | | | | | | | |
| PA | RAMETER | e E | STIMATI | Š | | MPTOT | | | | | IC 95 % | |
| | | | | | 510 | . Err | OR | | | ENCE | INTERVAL | |
| A | | 0.087 | 053766 | 3 n | 0196 | 08378 | 69 ~ | 1620 | LOWER | U 33 | UPPER 619782639 | |
| В | | | | | | | | | | | 307180239 | |
| С | | | | | | | | | | | 989272024 | |
| D | | | | | | | | | | | 927393439 | |
| - | | 0.012 | 200013. | | 0201 | 0,000 | | 1740 | 0030020 | O • T 1 | 76133333 | |
| | | | | | | | | 1240 | | | | |
| LOT | ХГ | XU I | ₹ | AUC | : | UCP | | | DIF | PC | T | |
| LOT 1 | 0 | XU 1 | R 00000 | AUC 0.1 | : .373 | UCP 0.08 | 6342 | 0. | DIF 0509578 | PC 37. | T 1142 | |
| LOT 1 2 | 0 8 | XU 1 8 1.0 39 3.8 | R 00000 87500 | AUC 0.1 0.1 | : .373 048 | UCP 0.08 0.10 | 6342 6436 | 0. -0. | DIF 0509578 0016362 | PC 37. | T 1142 5613 | |
| LOT 1 2 3 | 0 8 39 1 | XU 1 8 1.0 39 3.0 | R 00000 87500 48387 | AUC 0.1 0.1 | : .373 048 .874 | UCP 0.08 0.10 0.08 | 6342 6436 8877 | 0. -0. -0. | DIF 0509578 0016362 0014768 | PC 37. -1. | T 1142 5613 6897 | |
| LOT 1 2 | 0 8 39 1 116 3 | XU 1 8 1.0 39 3.0 16 2.6 | R 00000 87500 | AUC 0.1 0.1 0.0 | : .373 048 | UCP 0.08 0.10 | 6342 6436 8877 4149 | 0. -0. -0. | DIF 0509578 0016362 | PC 37. -1. -1. | T 1142 5613 | |

| NON-LINE | EAR LE | east s | QUARES SU | mmary si | 'ATISTICS | DEPEND | ENT VARIABLE TCA | | | |
|--|---|---|--|--|---|---|---|--|--|--|
| SOURC | E | | DF | SUM OF | SQUARES | MEAN SQ | UARE | | | |
| SOURC REGRE | SSIO | 4 | 4 | 2881. | 6655470 | 720.416 | | | | |
| DECT | TAIT | | 4 2 | 3. | 1045404 | 1.5522747 | | | | |
| UNCOR | RECTI | TOT GE | 'AL 6 L) 5 | 2884. | 7700964 | | | | | |
| (CORE | TECTOR | מידירוידי כ | T.) 5 | 403. | 6845454 | | | | | |
| PARAM | | | STIMATE | ASYMPI | OTIC | ASYM | PTOTIC 95 % ENCE INTERVAL | | | |
| | | _ | | STD. F | TRROR | CONFID | ENCE INTERVAL | | | |
| | | | | 010 | autort. | LOWER | | | | |
| A | | 0.833 | 2392236 0 | .1324004 | 0025 0.263 | | 1.4029184257 | | | |
| В | | | | | | | 0.0256149362 | | | |
| č | | | | | | | 0.2220716991 | | | |
| D | | | | | | | 0.0420909991 | | | |
| D | | .005 | .3137370 0 | .0103340 | 0.000 | 773047423 | 0.0420303331 | | | |
| LOT | YT. | ΧU | R | AUC | i iCD | DIF | PCT | | | |
| 1 | | | 1.00000 | | | | 5 -11.056 | | | |
| | | | 1.35714 | | | | 3 13.114 | | | |
| | 33 | | 3.57895 | | | | 2 -0.017 | | | |
| | | | 0.98529 | | | | 7 0.477 | | | |
| 5 | | | 1.20896 | | | | 4 -1.251 | | | |
| 6 | 249 | | 0.71605 | | | | 5 0.404 | | | |
| J | 2.13 | 50, | 0.,1003 | 0.3333 | 0.331111 | 0.00133 | 0.101 | | | |
| | | | | SYS=A | SW-32 | | | | | |
| | | | | 010 | D., 02 | | | | | |
| | | | | | | | | | | |
| NON-LINE | AR LI | east s | QUARES SU | mmary st | ATISTICS | DEPENDI | ENT VARIABLE TCA | | | |
| | | east s | | | | | | | | |
| SOURC | Œ | | DF | SUM OF | SQUARES | MEAN SQI | JARE | | | |
| SOURC | Œ SSION | 1 | DF 4 | SUM OF 297.6 | SQUARES | MEAN SQI 74.4100 | JARE 5562 | | | |
| SOURC | Œ SSION | 1 | DF 4 | SUM OF 297.6 | SQUARES | MEAN SQI | JARE 5562 | | | |
| SOURC | Œ SSION | 1 | DF | SUM OF 297.6 | SQUARES | MEAN SQI 74.4100 | JARE 5562 | | | |
| SOURC RECRE RESID UNCOR | E SSION DUAL RECTI | N ED TOT | DF 4 2 'AL 6 | SUM OF 297.6 3.2 300.8 | SQUARES 4022248 3785120 7807368 | MEAN SQI 74.4100 | JARE 5562 | | | |
| SOURC RECRE RESID UNCOR | E SSION DUAL RECTI | 1 | DF 4 2 'AL 6 | SUM OF 297.6 | SQUARES 4022248 3785120 7807368 | MEAN SQI 74.4100 | JARE 5562 | | | |
| SOURC RECRE RESID UNCOR | E SSION DUAL RECTI | N ED TOT D TOTA | DF 4 2 'AL 6 | SUM OF 297.6 3.2 300.8 | SQUARES 4022248 3785120 7807368 | MEAN SQI 74.4100 1.6189 | JARE 5562 2560 | | | |
| SOURC RECRE RESID UNCOR | E SSION DUAL RECTI | N ED TOT D TOTA | DF 4 2 'AL 6 | SUM OF 297.6 3.2 300.8 54.9 | SQUARES 4022248 3785120 7807368 0298664 | MEAN SQI 74.4100 1.6189 | JARE 5562 2560 PTOTIC 95 % | | | |
| SOURC RECRE RESID UNCOR | E SSION DUAL RECTI | N ED TOT D TOTA | DF 4 2 'AL 6 | SUM OF 297.6 3.2 300.8 54.9 | SQUARES 4022248 3785120 7807368 | MEAN SQI 74.4100 1.6189 ASYMI CONFIDI | JARE 5562 2560 PTOTIC 95 % ENCE INTERVAL | | | |
| SOURC RECRE RESID UNCOR (CORR | E SSION DUAL RECTI | N ED TOTA E | DF 4 2 AL 6 L) 5 STIMATE | SUM OF 297.6 3.2 300.8 54.9 ASYMPT STD. E | SQUARES 4022248 3785120 7807368 0298664 OTIC TROOR | MEAN SQI 74.4100 1.6189 ASYMI CONFIDI LOWER | JARE 5562 2560 PTOTIC 95 % ENCE INTERVAL UPPER | | | |
| SOURC REGRE RESID UNCOR (CORR PARAM | E SSION DUAL RECTI | N ED TOTA E 0.261 | DF 4 2 2 | SUM OF 297.6 3.2 300.8 54.9 ASYMPT STD. E | SQUARES 4022248 3785120 7807368 0298664 OTIC TROR | MEAN SQI 74.4100 1.6189 ASYMI CONFIDI LOWER 945442595 | JARE 5562 2560 PTOTIC 95 % ENCE INTERVAL UPPER 1.0184679768 | | | |
| SOURC REGRE RESID UNCOR (CORR PARAM A B | E SSION DUAL RECTI | N ED TOTA E 0.261583 | DF 4 2 AL 6 L) 5 STIMATE | SUM OF 297.6 3.2 300.8 54.9 ASYMPT STD. E .1758212 .5599667 | SQUARES 4022248 3785120 7807368 0298664 OTIC RROR 5599 -0.49 | MEAN SQI 74.4100 1.61893 ASYMI CONFIDI LOWER 845442595 925233506 | JARE 5562 2560 PTOTIC 95 % ENCE INTERVAL UPPER 1.0184679768 1.8262147953 | | | |
| SOURC REGRE RESID UNCOR (CORR PARAM A B C | E SSION DUAL RECTI | O.261 | DF 4 2 2 4 6 5 5 5 5 5 5 5 6 5 6 6 6 6 6 6 6 6 6 | SUM OF 297.6 3.2 300.8 54.9 ASYMPT STD. E .1758212 .5599667 .6786640 | SQUARES 4022248 3785120 7807368 0298664 OTIC RROR 55599 -0.49 8201 -2.99 3320 -2.29 | MEAN SQI 74.4100 1.6189 ASYMI CONFIDI LOWER 945442595 925233506 960832635 | JARE 5562 2560 PTOTIC 95 % ENCE INTERVAL UPPER 1.0184679768 1.8262147953 3.5440922077 | | | |
| SOURC REGRE RESID UNCOR (CORR PARAM A B | E SSION DUAL RECTI | O.261 | DF 4 2 2 4 6 5 5 5 5 5 5 5 6 5 6 6 6 6 6 6 6 6 6 | SUM OF 297.6 3.2 300.8 54.9 ASYMPT STD. E .1758212 .5599667 .6786640 | SQUARES 4022248 3785120 7807368 0298664 OTIC RROR 5599 -0.49 | MEAN SQI 74.4100 1.6189 ASYMI CONFIDI LOWER 945442595 925233506 960832635 | JARE 5562 2560 PTOTIC 95 % ENCE INTERVAL UPPER 1.0184679768 1.8262147953 | | | |
| SOURC RECRE RESID UNCOR (CORR PARAM A B C D | E CSSION DUAL PRECTE PECTEI PETER | 0.261 583 0.624 | DF 4 2 2AL 6 3.STIMATE .9618586 0 1542777 0 0044721 0 0645653 0 | SUM OF 297.6 3.2 300.8 54.9 ASYMPT STD. E .1758212 .5599667 .6786640 .2425781 | SQUARES 4022248 3785120 7807368 0298664 OTIC RROR 5599 -0.49 8201 -2.99 3320 -2.29 1890 -1.24 | MEAN SQI 74.4100 1.6189 ASYMI CONFIDI LOWER 945442595 925233506 960832635 458054375 | PTOTIC 95 % ENCE INTERVAL UPPER 1.0184679768 1.8262147953 3.5440922077 0.8416763069 | | | |
| SOURCE REGRE RESIDUNCOR (CORREDARAM A B C D | E CSSION DUAL PRECTE PECTEI PETER | 0.261 583 0.624 202 | DF 4 2 AL 6 L) 5 STIMATE 9618586 0 1542777 0 0044721 0 0645653 0 | SUM OF 297.6 3.2 300.8 54.9 ASYMPT STD. E .1758212 .5599667 .6786640 .2425781 | SQUARES 4022248 3785120 7807368 0298664 OTIC TROR 5599 -0.49 8201 -2.99 3320 -2.29 1890 -1.24 | MEAN SQI 74.4100 1.6189 ASYMI CONFIDI LOWER 945442595 925233506 960832635 158054375 | PTOTIC 95 % ENCE INTERVAL UPPER 1.0184679768 1.8262147953 3.5440922077 0.8416763069 PCT | | | |
| SOURCE REGRE RESIDUNCOR (CORREDARAM A B C D LOT 1 | E CSSION DUAL RECTE RECTER RETER XL 0 | 0.261 583 0.624 202 | DF 4 2 AL 6 L) 5 STIMATE 9618586 0 1542777 0 0044721 0 00645653 0 | SUM OF 297.6 3.2 300.8 54.9 ASYMPT STD. E .1758212 .5599667 .6786640 .2425781 AUC 0.2338 | SQUARES 4022248 3785120 7807368 0298664 OTIC RROR 5599 -0.49 8201 -2.99 3320 -2.29 1890 -1.24 | MEAN SQI 74.4100 1.6189: ASYMI CONFIDI LOWER 945442595 925233506 960832635 158054375 DIF 0.024576 | PTOTIC 95 % ENCE INTERVAL UPPER 1.0184679768 1.8262147953 3.5440922077 0.8416763069 PCT 8 10.512 | | | |
| SOURCE REGRE RESIDUNCOR (CORREDARAM A B C D LOT 1 2 | E CSSION DUAL PRECTE RECTER RETER XL 0 12 | 0.261 583 0.624 202 XU 12 38 | DF 4 2 AL 6 L) 5 STIMATE 9618586 0 1542777 0 0044721 0 0645653 0 R 1.00000 2.16667 | SUM OF 297.6 3.2 300.8 54.9 ASYMPT STD. E .1758212 .5599667 .6786640 .2425781 AUC 0.2338 0.1643 | SQUARES 4022248 3785120 7807368 0298664 OTIC RROR 5599 -0.49 8201 -2.99 3320 -2.29 1890 -1.24 UCP 0.209222 0.148447 | MEAN SQI 74.4100 1.61893 ASYMI CONFIDI LOWER 945442595 925233506 960832635 158054375 DIF 0.024576 0.015853 | PTOTIC 95 % ENCE INTERVAL UPPER 1.0184679768 1.8262147953 3.5440922077 0.8416763069 PCT 8 10.512 3 9.649 | | | |
| SOURCE REGRE RESIDUNCOR (CORREDARAM A B C D LOT 1 2 3 | E SSION UAL RECTE ECTEI ETER XL 0 12 38 | 0.261 583 0.624 202 XU 12 38 86 | DF 4 2 AL 6 L) 5 STIMATE 9618586 0 1542777 0 0044721 0 0645653 0 R 1.00000 2.16667 1.84615 | SUM OF 297.6 3.2 300.8 54.9 ASYMPT STD. E .1758212 .5599667 .6786640 .2425781 AUC 0.2338 0.1643 0.1524 | SQUARES 4022248 3785120 7807368 0298664 OTIC RROR 5599 -0.49 8201 -2.99 3320 -2.29 1890 -1.24 UCP 0.209222 0.148447 0.160313 | MEAN SQI 74.4100 1.61893 ASYMI CONFIDI LOWER 945442595 925233506 960832635 458054375 DIF 0.024573 0.015853 -0.007913 | PTOTIC 95 % ENCE INTERVAL UPPER 1.0184679768 1.8262147953 3.5440922077 0.8416763069 PCT 8 10.512 9 9.649 3 -5.193 | | | |
| SOURCE REGRE RESIDUNCOR (CORREDARAM A B C D LOT 1 2 3 4 | E ESSION UAL RECTE ECTEI ETER XL 0 12 38 86 | 0.261 583 0.624 202 XU 12 38 86 134 | DF 4 2 2AL 6 L) 5 STIMATE 9618586 0 1542777 0 0044721 0 00645653 0 R 1.00000 2.16667 1.84615 1.00000 | SUM OF 297.6 3.2 300.8 54.9 ASYMPT STD. E .1758212 .5599667 .6786640 .2425781 AUC 0.2338 0.1643 0.1524 0.0974 | SQUARES 4022248 3785120 7807368 0298664 OTIC RROR 25599 -0.49 8201 -2.99 3320 -2.29 1890 -1.24 UCP 0.209222 0.148447 0.160313 0.122968 | ASYMI CONFIDI LOWER 45442595 925233506 960832635 458054375 DIF 0.024576 0.015851 -0.007911 -0.025566 | PTOTIC 95 % ENCE INTERVAL UPPER 1.0184679768 1.8262147953 3.5440922077 0.8416763069 PCT 8 10.512 9.649 3 -5.193 3 -26.250 | | | |
| SOURCE REGRE RESIDUNCOR (CORREDARAM A B C D LOT 1 2 3 | E SSION UAL RECTE ECTEI ETER XL 0 12 38 | 0.261 583 0.624 202 XU 12 38 86 | DF 4 2 AL 6 L) 5 STIMATE 9618586 0 1542777 0 0044721 0 0645653 0 R 1.00000 2.16667 1.84615 | SUM OF 297.6 3.2 300.8 54.9 ASYMPT STD. E .1758212 .5599667 .6786640 .2425781 AUC 0.2338 0.1643 0.1524 | SQUARES 4022248 3785120 7807368 0298664 OTIC RROR 5599 -0.49 8201 -2.99 3320 -2.29 1890 -1.24 UCP 0.209222 0.148447 0.160313 | MEAN SQI 74.4100 1.61893 ASYMI CONFIDI LOWER 945442595 925233506 960832635 458054375 DIF 0.024573 0.015853 -0.007913 | PTOTIC 95 % ENCE INTERVAL UPPER 1.0184679768 1.8262147953 3.5440922077 0.8416763069 PCT 8 10.512 9.649 3 -5.193 3 -26.250 5 15.979 | | | |

----- SYS=JTIDS ------

38 86 1.84615 0.1236 0.113302 0.010298 8.332

86 134 1.00000 0.1287 0.129633 -0.000933 -0.725 134 184 1.04167 0.1310 0.128968 0.002032 1.551 184 264 1.60000 0.1154 0.117671 -0.002271 -1.968

NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA

 SOURCE
 DF
 SUM OF SQUARES
 MEAN SQUARE

 RECRESSION
 4
 1571.0286520
 392.7571630

 RESIDUAL
 1
 0.0133862
 0.0133862

 UNCORRECTED TOTAL
 5
 1571.0420382

(CORRECTED TOTAL) 4 40.2575028

3

| PARAMETER | | ESTIMAT | | PTOTIC ERROR | ASYMPTOTIC 95 % CONFIDENCE INTERVAL | | | | |
|-----------|----------------|---------|----------|-----------------|-------------------------------------|----------------|------------|--|--|
| | | | | 515. | Educore | LOWER | UPPER | | |
| A | | 0.71 | 23306580 | 0.009503 | 27022 0.59 | 9158210655 0.8 | | | |
| В | | | | | | 0883209065 0.0 | • | | |
| С | | 02 | 66094010 | 0.030227 | 47827 43 | 1067973992 0.3 | 5746093789 | | |
| D | | 0.00 | 57233491 | 0.011617 | 559591 | 4188936301 0.1 | 5333606118 | | |
| | | | | | | | | | |
| LOT | \mathbf{x} L | ΧU | R | AUC | UCEP | DIF | PCT | | |
| 1 | 0 | 45 | 1.00000 | 0.4068 | 0.406661 | 0.00013935 | 0.03426 | | |
| 2 | 45 | 121 | 1.68889 | 0.2764 | 0.276378 | 0.00002173 | 0.00786 | | |
| 3 | 121 | 198 | 1.01316 | 0.2466 | 0.247429 | -0.00082856 | -0.33599 | | |
| 4 | 198 | 270 | 0.93506 | 0.2308 | 0.229547 | 0.00125288 | 0.54284 | | |
| 5 | 270 | 327 | 0.79167 | 0.2205 | 0.221091 | -0.00059143 | -0.26822 | | |

| SYS=LANNAV | | | | | | | | | | | |
|---------------------------------|---------------------------------|--|--|--|--|--|---|--|--|--|--|
| NON-LIN | vear l | EAST | | SUMMARY S | | | ENT VARIABLE TCA | | | | |
| RESI UNCO | RESSIO DUAL DRRECT | ED TO | TAL | DF SUM OF 4 8733 3 7 8733 6 1738 | 9.224642 0.006254 9.230896 | 2 21834.80 4 0.00 | | | | | |
| PAR | AMETE | TR | ESTIMAT | | PTOTIC ERROR | | ENCE INTERVAL | | | | |
| A B C D | | -0.1 -0.0 | 13344103 00418780 | 0.000448 0.000078 | 102870 -0 143678 -0 | 0.1147699547 0.0006684054 | UPPER 1.8248832153 -0.1119182520 -0.0001691553 0.0001461536 | | | | |
| LOT | ХL | υx | R | AUC | UCP | DIF | PCT | | | | |
| 1 2 3 4 5 6 7 | 4 38 176 320 464 | 4 38 176 320 464 608 724 | 8.50000 4.05882 1.04348 1.00000 1.00000 0.80556 | 1.3199 1.0761 0.9679 0.9184 0.8854 0.8643 | 1.3199 1.07608 0.96813 0.91804 0.8856 0.86414 | 3 0.0000203 1 -0.0002061 4 0.0003557 7 -0.0002743 | 6 -0.005619 2 0.001888 2 -0.021295 | | | | |
| NON LTN | TEAD I | EXCE | | SYS=L | | re DEDENF | ENT VARIABLE TCA | | | | |
| SOUR RECK RESI UNCC | RCE RESSIO DUAL DRRECT | N Ed To | TAL | DF SUM OF 4 6480 3 7 6480 | SQUARES 03.844449 0.036326 03.88077 | 5 MEAN SQ 9 16200.96 5 0.01 | UARE 1112 | | | | |
| | RECTE METER | | AL) ESTIMATE | ASYMP | 5.420992 TOTIC ERROR | ASYM CONFID | PTOTIC 95 % ENCE INTERVAL | | | | |
| A B C D | | -0.1 -0.0 | 05073600 00217308 | 0.001248 | 37207 -0 12533 -0 | 0.1090465440 | UPPER 1.5472732861 -0.1011006558 0.0005755332 0.0001939188 | | | | |
| LOT | XL | XU | R | AUC | UC | TP DIF | PCT | | | | |

1.4375

1.1286

0.9375

1.45610

1.12860 0.93750

1.00000

8.50000 3.76471

4

38

166

4 38

1 2 3 -1.2942 0.0002

0.0001

-0.018604

0.000002

0.000001

| 4 5 6 7 | 166 310 454 598 | 310 454 598 714 | 1.12500 1.00000 1.00000 0.80556 | 0.8490 0.8081 0.7795 0.7619 | 0.8071 0.7801 0.7621 | LO 0.00 L3 -0.00 LO -0.00 | | -0.0275 0.1242 -0.0809 -0.0264 |
|------------------|--------------------------|--------------------------|--|--------------------------------------|----------------------------|---------------------------------|---------|---|
| NON_I T | ATENAD TI | | | | | | יייי עא | RIABLE TCA |
| | | | | | | | | KIRDLE ICA |
| SOUT | rce Ression | | DF S | SUM OF S 11937. | | MEAN SQ 2984.37 | | |
| RESI | DUAL | | 1 | 0. | 890024 | | 0024 | |
| UNCC | RRECTI | ED TOTA | ∆ ∟ 5 | 11938. | 396467 | | | |
| (COF | RECTE | O TOTAL | (L) 4 | 1483. | 530658 | | | |
| PARA | METER | ES | STIMATE | | | ASYM | | |
| | | | | STD. ER | ROR | CONFID LOWER | | |
| A | | 0.6979 | 5337602 0.0 | 4062413 | 242 0.181 | | | |
| В | | | L376166 0.0 | | | | | |
| C D | | | 1061307 0.0 5687334 0.0 | | | | | 0994202 3843313 |
| D | | 002. | 0.0 | 0037124 | 702003 | 132113000 | 0.076 | 3043313 |
| LOT | XL | υX | | | UCP | | | PCT |
| 1 | 0 | 79 | 1.00000 | | 0.436295 | | | .4575 |
| 2 | 79 271 | | 2.43038 C 1.00000 C | | 0.335300 0.301071 | 0.00000 -0.00357 | | .0000 |
| 4 | 463 | | | | | 0.00327 | | |
| 5 | 655 | 720 | | | 0.269300 | 0.00000 | | .0000 |
| | | | | | | | | |
| C.8.4 | Helico | opter F | rograms | | | | | |
| | | | | | | | | |
| | | | | SYS=HH | -52 | | | |
| NON-LIN | EAR LE | EAST SO | UARES SUMM | ARY STA | ristics | DEPEND | ENT VA | RIABLE TCA |
| SOUR | CE | | DF S | UM OF SO | QUARES | MEAN SQ | UARE | |
| | ESSION | 1 | 4 | 3109.73 | | 777.434 | | |
| | DUAL | D TOTA | 2 L 6 | | 236296 | 0.611 | 8148 | |
| UNCO | RRECIE | LO TOTA | T 6 | 3110.96 | 520250 | | | |
| (COR | RECTEL | TOTAL | 5 | 731.19 | 991835 | | | |
| PARA | METER | ES | TIMATE | ASYMPTO! | ric | ASYM | PTOTIC | 95 % |
| | | | | STD. ERF | ROR | | ENCE II | NTERVAL |
| A | | 2.447 | 061845 0.1 | 08774033 | 273 1.97 | LOWER 90398141 | 2,915 | UPPER 0838754 |
| В | | | 949052 0.0 | | | | | 3604216 |
| C | | | 034252 0.2 | | | | 1.282 | 1337381 |
| Đ | | -0.160 | 697748 0.1 | 35347122 | 264 -0.74 | 30558130 | 0.421 | 5603162 |

| LOT XL | XU I | ₹ | AUC | UCP | DIF | PCT |
|--|---|--|--|--|---|--|
| 1 0 2 28 3 43 4 60 5 75 6 87 | 43 0.5 60 1.5 75 0.8 87 0.8 | 00000 53571 13333 88235 30000 | 1.577 1.104 1.085 1.012 1.041 1.055 | 1.57536 1.10307 1.09549 1.06133 1.01204 0.99484 | 0.001644 0.000929 -0.010494 -0.049326 0.028964 0.060164 | 0.1043 0.0842 -0.9672 -4.8741 2.7823 5.7028 |
| | | | SYS=CH- | -46 | | |
| NON-LINEAR L | EAST SQUAR | RES SUMM | IARY STAT | TISTICS | DEPENDENT | VARIABLE TCA |
| SOURCE REGRESSIC RESIDUAL UNCORRECT | ED TOTAL | 4 4 8 | 359613. | .09265 .92651 .01916 | MEAN SQUARE 89384.52316 518.73163 | |
| CORRECTE | D TOTAL) | 7 | 57764. | | | |
| PARAMETER | ESTIN | | ASYMPTOT STD. ERF | | ASYMPTOT CONFIDENCE LOWER | |
| A B C D | 9.324267 -0.200928 -0.048511 0.007479 | 3871 0. LO96 0. | 04606988 06121438 | 874 -0.3288 899 -0.2184 | 4888363 15. 3376533 -0. 4671895 0. 7709116 0. | 366045541 073020088 121444998 |
| LOT XL | ΧU | R | AUC | UCP | DIF | PCT |
| 1 0 2 14 3 50 4 110 5 195 6 394 7 486 8 576 | 50 2 110 1 195 1 394 2 486 0 576 0 | 2.00000 2.57143 2.66667 2.41667 2.34118 2.46231 2.97826 2.53333 | 7.541 3.898 2.766 2.419 1.986 2.236 2.370 2.547 | 1.98293 | 1.04561 0.24201 -0.22920 -0.18421 0.00307 -0.18294 0.31693 0.33152 | |
| | | | - SYS=H- | 53 | | |
| NON-LINEAR L | EAST SQUAR | ES SUMM | ary stat | 'ISTICS | DEPENDENT | VARIABLE TCA |
| | ED TOTAL | 4 4 8 | 618986. 92. 619078. | 38829 1 37697 76526 | MEAN SQUARE 54746.59707 23.09424 | |
| (CORRECTE) PARAMETER | D TOTAL) ESTIMA | TE A | 355155. SYMPTOTI STD. ERR | C | ASYMPTOTIC CONFIDENCE | |

| A B C D | | -0.1463 0.0022 | 30073 0. 60500 0. | 0182827110 003916994: | 36 6.0925 30 -0.1970 15 -0.0086 35 -0.0010 | 903296 -0. 146717 0. | UPPER 103592332 095569816 013135673 000561199 |
|--------------------------------------|---|---|---|---|---|--|---|
| LOT | ΧΓ | υx | R | AUC | UCEP | DIF | PCT |
| 1 2 3 4 5 6 7 8 | 0 10 141 281 293 323 331 361 | 10 141 281 293 323 331 361 367 | 1.0000 13.1000 1.0687 0.0857 2.5000 0.2667 3.7500 0.2000 | 4.264 3.762 3.382 3.341 3.154 3.685 | 6.78831 4.26419 3.75529 3.54158 3.58741 3.48261 3.55020 3.42571 | -0.03631 -0.00019 0.00671 -0.15958 -0.24641 -0.32861 0.13480 0.52129 | -0.538 -0.005 0.178 -4.719 -7.375 -10.419 3.658 13.207 |
| | | | | | | | |
| NON-LINEA | R LE | ast squ | ares sum | MARY STAT | STICS | DEPENDENT | VARIABLE TCA |
| | SION JAL VECTE | TOTAL | 4 8 | | 52362 1. 91137 53499 | MEAN SQUARE 19250.15591 1107.48892 | • |
| PARAME | TER | EST | IMATE | ASYMPTOTI STD. ERRO | | ASYMPTOT CONFIDENCE LOWER | |
| A B C D | | 9.2004 -0.1952 0.0334 -0.0185 | 94087 0. 45360 0. | .068968042 .067654261 | 6 -0.3543 | 086758 13. 362130 -0. 571527 0. | 995724876 036251961 |
| 6 7 8 9 10 11 | XL 0 18 42 66 126 128 358 442 585 630 666 678 | XU 18 42 66 126 198 358 442 585 630 666 678 690 | R 1.00000 1.33333 1.00000 2.50000 1.20000 2.22222 0.52500 1.70238 0.31469 0.80000 0.33333 1.00000 | AUC 6.181 5.226 4.559 3.459 2.760 2.307 2.313 2.695 3.463 3.085 3.671 3.852 | UCP 5.94007 4.41779 4.00040 2.91588 3.25683 2.48869 2.74306 2.47444 2.47991 2.55051 2.43987 2.52592 | DIF 0.24093 0.80821 0.55860 0.54312 -0.49683 -0.18169 -0.43006 0.22056 0.98309 0.53449 1.23113 1.32608 | PCT 3.898 15.465 12.253 15.702 -18.001 -7.875 -18.593 8.184 28.388 17.325 33.537 34.426 |

| PARAMETER | | ₹ | ESTIMATE | ASY STD | MPTOTI . ERRO | | ASYMPTOTIC 95 % CONFIDENCE INTERVAL LOWER UPPER | | | | | |
|-----------|----|-----|-----------|------------|------------------|---|---|---------------|--|--|--|--|
| Α | | 9. | 241541094 | | | 0 | 9.2415410940 | 9.2415410940 | | | | |
| В | | -0. | 065204779 | 0 | | | -0.0652047792 | -0.0652047792 | | | | |
| С | | -0. | 015984625 | 0 | | | -0.0159846252 | -0.0159846252 | | | | |
| D | | 0. | 001387580 | 0 | | | 0.0013875804 | 0.0013875804 | | | | |
| LOT | ХĽ | χU | R | AUC | UCP | | DIF | PCT | | | | |
| 1 | 0 | 3 | 1.00000 | 9.2 | 9.2 | | 0 | 0 | | | | |
| 2 | 3 | 28 | 8.33333 | 7.1 | 7.1 | | -4.44089E-16 | -6.25478E-15 | | | | |
| 3 | 28 | 63 | 1.40000 | 6.7 | 6.7 | | 2.22045E-16 | 3.31410E-15 | | | | |
| 4 | 63 | 92 | 0.82857 | 6.6 | 6.6 | | 2.10942E-15 | 3.19610E-14 | | | | |

| S | v | 5 | = | | | 3 |
|---|---|---|---|---|---|----|
| _ | 1 | _ | _ | - | _ | _, |

| NON | -t.tne: | AR T.E. | AST SO | UARES S | SC IN | MARY | ደ ሞልጥ | ויצזי | rtcs | : | कात | PENI | DENT | VARIAB | æ | TCA |
|-------|---------|---------|---------|---------|-------|--------|--------------|-------|------|------|-------|------------|-------------|---|-----|-----|
| LIOLI | D1145 | ar un | ent na | om co | ,,, | 4 4411 | D 1611 | -0. | | | | | J | *************************************** | | |
| : | SOURCI | E | | I | F | SUM O | F SQ | UAF | ŒS | | MEAN | 1 S(| QUARE | E | | |
| 1 | REGRE | SSION | | | 4 | 727 | 37.1 | 492 | 293 | 1 | L8184 | 1.2 | 87323 | 3 | | |
| 1 | RESID | UAL | | | 5 | 2 | 39.1 | 642 | 249 | | 47 | 7.83 | 32850 |) | | |
| 1 | UNCORI | RECTE | D TOTAL | Ĺ | 9 | 729 | 76.3 | 135 | 542 | | | | | | | |
| | (CORRI | ECTED | TOTAL |) | 8 | 130 | 13.6 | 906 | 62 | | | | | | | |
| j | PARAM | ETER | ES' | rimate | | ASYM | PTOT | IC | | | 1 | ASYI | PTOI | TIC 95 | b | |
| | | | | | | STD. | ERR | OR | | | COF | FII | DENCE | INTER | /AL | J |
| | | | | | | | | | | | LOV | ÆR | | UPI | PER | |
| i | A | | 4.612 | 074568 | 0. | 64985 | 5547 | 11 | 2. | 9415 | 59191 | L49 | 6.2 | 2825572 | 210 | l |
| 1 | В | | -0.222 | 589525 | 0. | 04552 | 8562 | 69 | -0. | 339€ | 52272 | 250 | -0.1 | .055563 | 250 | l |
| (| C | | | 373489 | | | | | | | | | | 2017094 | 543 | í |
| 1 | D | | -0.022 | 717363 | 0. | 01567 | 2938 | 90 | -O. | 0630 | 00535 | 511 | 0.0 | 175706 | 251 | • |
| 1 | LOT | ХL | χυ | R | | AU | С | | UCP | | | OIF | | P | T | |
| | 1 | 0 | 20 | 1.000 | 000 | 3. | 327 | 3 | 3.36 | 668 | -(| 0.0 | 3968 | -1. | L93 | ; |
| | | 20 | 69 | 2.450 | 000 | 2. | 480 | 2 | .50 | 866 | -0 | 0.02 | 2866 | -1. | L55 |) |
| | 2 3 | 69 | 140 | 1.448 | 398 | 2. | 319 | 2 | 2.25 | 627 | (| 0.00 | 5273 | 2. | 705 | • |
| | 4 | 140 | 185 | 0.633 | 380 | 1. | 811 | 1 | 83 | 582 | -(| 0.02 | 2482 | -1. | 370 | J |
| | 5 | 185 | 221 | 0.800 | 000 | 1. | 870 | 1 | 83 | 774 | 0 | 0.03 | 3226 | 1. | 725 | 1 |
| | 6 | 221 | 257 | 1.000 | 000 | 1. | 589 | 1 | 86 | 427 | -0 | 2.2 | 7527 | -17. | 324 | : |
| | 7 | 257 | 287 | 0.833 | 333 | 1. | 703 | 1 | .76 | 064 | -6 | 0.05 | 5764 | -3. | 385 | ı |
| | 8 | 287 | 335 | 1.600 | 000 | 1. | 930 | 1 | 91 | 738 | (| 0.01 | L262 | 0.6 | 554 | |
| | 9 | 335 | 350 | 0.312 | 250 | 2. | 144 | 1 | 43 | 668 | C | .70 | 732 | 32.9 | 91 | |
| | | | | | | | | | | | | | | | | |

C.8.5 - Tactical Armament Programs

----- SYS=LLLGB -----

| NON-LINEAR LE | EAST SQUARES | SUMMAR | Y STATIS | TICS | DEPENDENT | VARIABLE | TCA |
|---------------|--------------|---------|----------|---------|-------------|------------|-----|
| SOURCE | | DF SUM | OF SQUA | RES | MEAN SQUAR | E | |
| REGRESSION | 1 | 4 2 | 20659.18 | 760 | 55164.7969 | 0 | |
| RESIDUAL | | 6 | 7.22 | 990 | 1.2049 | 8 | |
| UNCORRECTE | ED TOTAL | 10 2 | 20666.41 | 749 | | | |
| (CORRECTED | TOTAL) | 9 | 31936.24 | 632 | | | |
| PARAMETER | ESTIMAT | E AS | YMPTOTIC | | ASYMPTO | TIC 95 % | |
| | | ST | D. ERROR | | CONFIDENC | e interval | Ĺ |
| | | | | | LOWER | UPPE | 3 |
| A | 0.081875767 | 1 0.003 | 14381181 | 0.07418 | 3313116 0.0 | 8956840304 | 4 |
| В | 172049288 | 1 0.003 | 65210298 | 18098 | 35668591 | 6311290758 | 8 |
| С | 0.001165533 | 5 0.003 | 64019053 | 00774 | 1169833 0.0 | 1007276524 | 4 |
| D | 000455418 | 6 0.001 | 10583461 | 00316 | 5130034 0.0 | 0225046318 | 3 |
| | | | | | | | |

```
LOT
          XT.
                XU
                      R
                            AUC
                                     UCP
                                                DIF
                                                          PCT
               1600 1.00000 0.0275 0.0279118 -0.00041177 -1.4973
               4550 1.84375 0.0206 0.0208354 -0.00023535 -1.1425
       1600
       4550
               8290 1.26780 0.0189 0.0182885 0.00061147 3.2353
       8290 17270 2.40107 0.0162 0.0161889 0.00001110 0.0685
     5 17270 26890 1.07127 0.0147 0.0147784 -0.00007840 -0.5333
     6 26890 41290 1.49688 0.0137 0.0137170 -0.00001704 -0.1244
     7 41290 56890 1.08333 0.0129 0.0128783 0.00002169 0.1681
     8 56890 72490 1.00000 0.0123 0.0122767 0.00002327 0.1892
     9 72490 88090 1.00000 0.0118 0.0118286 -0.00002857 -0.2421
    10 88090 100000 0.76346 0.0115 0.0114990 0.00000100 0.0087
                  ----- SYS=CEM -----
NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA
                        DF SUM OF SQUARES MEAN SQUARE 4 1106605.2347 276651.3087
   SOURCE
   REGRESSION
   RESIDUAL
                                  507.9642
                                                126,9911
   UNCORRECTED TOTAL
                        8 1107113.1989
   (CORRECTED TOTAL) 7 367517.1256
   PARAMETER
                 ESTIMATE ASYMPTOTIC
                                                 ASYMPTOTIC 95 %
                             STD. ERROR
                                                CONFIDENCE INTERVAL
                                                LOWER
   Α
             0.1182807993 0.04281435771 -.00058930616 0.23715090482
             -.1953660986 0.02765118984 -.27213707052 -.11859512670
   В
   C
             0.0042048544 0.00577218897 -.01182109457 0.02023080339
             -.0015240464 0.00100615476 -.00431754206 0.00126944925
   LOT
       XL XU R
                             AUC
                                  UCP
                                                     DIF PCT
           Ω
               172 1.00000 0.06924 0.0543398 0.0149002 21.5197
          172 1432 7.32558 0.03038 0.0237469 0.0066331 21.8339
         1432
                7557 4.86111 0.01988 0.0205487 -0.0006687 -3.3636
         7557 21777 2.32163 0.01765 0.0186074 -0.0009574 -5.4242
    5
        21777 50227 2.00070 0.01619 0.0157053 0.0004847 2.9937
        50227 85247 1.23093 0.01401 0.0139354 0.0000746 0.5326
       85247 134157 1.39663 0.01258 0.0126965 -0.0001165 -0.9257
    8 134157 171666 0.76690 0.01181 0.0118134 -0.0000034 -0.0285
               ------ SYS=GBU-15 ------
NON-LINEAR LEAST SQUARES SUMMARY STATISTICS
                                              DEPENDENT VARIABLE TCA
                        DF SUM OF SQUARES MEAN SQUARE 4 39978.151274 9994.537818 5 102.134963 20.426993
   SOURCE
   REGRESSION
  RESIDUAL 5 102.134963
UNCORRECTED TOTAL 9 40080.286237
(CORRECTED TOTAL) 8 10225.399632
                                              20.426993
```

| PAR | AMETEI | R E | STIMATE | asyn std. | MPTOTIC ERROR | | ASY CONFIL LOWER | MPTOTIC 95 % DENCE INTERVAL UPPER |
|-----|--------|--------|---------|--------------|------------------|--------|------------------------|---|
| A | | 0.1633 | 332802 | 0.06426 | 367496 | 001 | | 0.32853877411 |
| В | | 0477 | 695586 | 0.04952 | 308717 | 175 | 07086183 | 0.07953174458 |
| С | | 0.0411 | 646747 | 0.01544 | 402810 | 0.001 | 46511206 | 0.08086423744 |
| D | | 0069 | 403884 | 0.002562 | 213937 | 013 | 52648185 | 00035429489 |
| | | | | | | | | |
| LOT | XL | υx | R | AUC | UC | P | DI | F PCT |
| 1 | 0 | 40 | 1.0000 | 0.19 | 75 0.1 | 57506 | 0.0399 | 94 20.250 |
| 2 | 40 | 105 | 1.6250 | 0.200 | 00 0.1 | 63887 | 0.0361 | .13 18.057 |
| 3 | 105 | 445 | 5.2307 | 7 0.143 | 39 0.1 | 44310 | -0.0004 | 10 -0.285 |
| 4 | 445 | 695 | 0.7352 | 9 0.148 | 33 0.1 | 42751 | 0.0055 | 3.742 |
| 5 | 695 | 1015 | 1.2800 | 0.130 | 0.1 | 56380 | -0.0255 | 80 -19.556 |
| 6 | 1015 | 1615 | 1.8750 | 0 0.17 | L8 0.1 | 69315 | 0.0024 | 185 1.447 |
| 7 | 1615 | 2215 | 1.0000 | 0.153 | 39 0.1 | 47449 | 0.0064 | 51 4.192 |
| 8 | 2215 | 2815 | 1.0000 | 0.148 | 33 0.1 | 46902 | 0.0013 | 98 0.943 |
| 9 | 2815 | 3415 | 1.0000 | 0.142 | 20 0.1 | .46475 | -0.0044 | 75 -3.152 |

C.8.6 - Tactical Missile Programs

| SYS=AMRAAM | |
|----------------|--|
| | |

| NON- | LINEAR | LEAST S | equares su | JMMARY S | STATISTICS | S DEPENDI | ENT VARIABLE TCA |
|--------|---------|---------|------------|----------|------------|------------|------------------|
| S | OURCE | | DF | SUM OF | SQUARES | MEAN SQU | JARE |
| | EGRESSI | ON | | | 5460.2541 | 816365.0 | |
| R | ESIDUAL | 1 | ϵ | | 384.6149 | 230. | |
| | NCORREC | | | | 844.8690 | 2001 | |
| | | | | | | | |
| (| CORRECT | ED TOTA | AL) 9 | 183 | 8807.0285 | | |
| | | | | | | | |
| P | ARAMETE | ir e | ESTIMATE | ASYME | TOTIC | ASYME | PTOTIC 95 % |
| | | | | STD. | ERROR | CONFIDE | ENCE INTERVAL |
| | | | | | | LOWER | UPPER |
| A | | | | | | 9496624812 | 6.1419379352 |
| В | | | | | | | -0.3215120530 |
| С | | | | | | | 0.0090273232 |
| D | 1 | 0.00 | 0737621 0 | .000923 | 399967 -0. | 0015233265 | 0.0029985683 |
| | | | | | | | |
| LOT | | | | AUC | UCE | DIF | PCT |
| 1 | 0 | 194 | 1.00000 | 1.233 | 1.23420 | -0.0011974 | -0.0971 |
| 2 3 | 194 | 1251 | 5.44845 | 0.512 | 0.51208 | -0.0000816 | -0.0159 |
| | 1251 | 3215 | 1.85809 | 0.342 | 0.33892 | 0.0030849 | 0.9020 |
| 4 | 3215 | 6211 | 1.52546 | 0.257 | 0.26118 | -0.0041762 | -1.6250 |
| 5 | 6211 | 9111 | 0.96796 | 0.232 | 0.22403 | 0.0079688 | 3.4348 |
| 6 | 9111 | 12011 | 1.00000 | 0.194 | 0.19975 | -0.0057522 | -2.9650 |
| 7 | 12011 | 14911 | 1.00000 | 0.182 | 0.18344 | -0.0014418 | -0.7922 |
| 8 | 14911 | 17911 | 1.03448 | 0.170 | 0.17087 | -0.0008719 | -0.5129 |
| 9 | 17911 | 20911 | 1.00000 | 0.158 | 0.16139 | -0.0033882 | -2.1444 |
| 10 | 20911 | 24674 | 1.25433 | 0.155 | 0.15079 | 0.0042130 | 2.7181 |

| | | SYS≃HARM | |
|--|---|--|---|
| NON-LINEAR LE | | | DEPENDENT VARIABLE TCA |
| SOURCE RECRESSION RESIDUAL UNCORRECTE | | SUM OF SQUARES 1585156.2088 884.5096 1586040.7184 | MEAN SQUARE 396289.0522 126.3585 |
| (CORRECTED | TOTAL) 10 | 338342.8883 | |
| PARAMETER | ESTIMATE | ASYMPTOTIC STD. ERROR | ASYMPTOTIC 95 % CONFIDENCE INTERVAL LOWER UPPER |
| | -0.219511233 0 -0.017378620 0 | .01429558754 -0.25 .00958535466 -0.040 | 23206601 2.1312102614 33151973 -0.1857072686 00445639 0.0052873242 39866878 0.0099162399 |
| 5 1399 6 3144 7 5612 | XU R 80 1.00000 316 2.95000 712 1.6779 1399 1.7348 3144 2.5400 5612 1.4143 7731 0.8585 | 0 0.517 0.463062 7 0.400 0.372500 5 0.314 0.311730 3 0.249 0.252338 3 0.223 0.225839 9 0.208 0.214597 | 0.0330938 4.0907 0.0539379 10.4329 0.0275001 6.8750 0.0022704 0.7230 -0.0033383 -1.3407 -0.0028389 -1.2731 -0.0065974 -3.1718 |
| 8 7731 9 9863 10 12863 11 15863 | 15863 1.00000 16961 0.36600 | 3 0.184 0.179491 0 0.177 0.176606 0 0.196 0.185725 | 0.0045089 2.4505 0.0003938 0.2225 0.0102746 5.2421 |
| NON-LINEAR LE | | SYS=IIR MARY STATISTICS | DEPENDENT VARIABLE TCA |
| SOURCE | DF 4 5 CD TOTAL 9 | SUM OF SQUARES 2027375.5260 4088.5793 2031464.1053 | MEAN SQUARE 506843.8815 817.7159 |
| PARAMETER | ESTIMATE | ASYMPTOTIC STD. ERROR | ASYMPTOTIC 95 % CONFIDENCE INTERVAL |
| B C | 2178424771 0. 0277469244 0. | .061745889773765 .015480130100675 | LOWER UPPER 56697608 2.0292312940 56303924 -0.0591219149 53928894 0.0120454400 |

0.0044028397 0.00384180432 -.00547268954 0.0142783690

D

```
LOT
        ΧL
               XU
                   R AUC UCP
                                            DIF
                                                    PCT
        0
              200 1.00000 0.309 0.256951 0.052049
                                                    16,844
         200
              1100 4.50000 0.135 0.139712 -0.004712 -3.490
        1100
            3700 2.88889 0.083 0.093260 -0.010260 -12.361
        3700
              9429 2.20346 0.082 0.073523 0.008477 10.338
    4
        9429 18429 1.57095 0.062 0.064431 -0.002431
    5
                                                   -3.921
       18429 30429 1.33333 0.057 0.057873 -0.000873 -1.531
    7
       30429 42429 1.00000 0.055 0.055641 -0.000641 -1.166
       42429 54429 1.00000 0.053 0.051917 0.001083 2.043
       54429 60664 0.51958 0.057 0.055606 0.001394
                                                    2.445
   ----- SYS=AIM7F-R ------
NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA
                    DF SUM OF SQUARES MEAN SQUARE
4 115016.42335 28754.10584
4 135.16155 33.79039
   SOURCE
  REGRESSION
                      4
  RESIDUAL
  UNCORRECTED TOTAL 8 115151.58490
   (CORRECTED TOTAL) 7
                          6543.29279
  PARAMETER ESTIMATE
                         ASYMPTOTIC
                                          ASYMPTOTIC 95 %
                                        CONFIDENCE INTERVAL
                         STD. ERROR
                                         LOWER
  Α
           2.847495934 0.30411208374 2.0031568524 3.6918350160
  В
           -0.380338179 0.02240005663 -0.4425298647 -0.3181464925
  С
           -0.007523489 0.02304299988 -0.0715002476 0.0564532696
           -0.001839594 0.00652258621 -0.0199489516 0.0162697634
  D
      XI. XU R AUC UCP
  LOT
                                      DIF
                                                PCT
   1
        0 100 1.00000 0.741 0.775384 -0.034384 -4.6402
   2
       100
             325 2.25000 0.378 0.332053 0.045947 12.1553
   3
       325
           925 2.66667 0.199 0.203751 -0.004751 -2.3872
       925 1725 1.33333 0.169 0.169503 -0.000503 -0.2979
      1725 2825 1.37500 0.134 0.136034 -0.002034 -1.5179
   5
       2825 4225 1.27273 0.116 0.115450 0.000550 0.4744
   6
   7
      4225 5125 0.64286 0.111 0.109276 0.001724 1.5529
      5125 6269 1.27111 0.095 0.095361 -0.000361 -0.3797
          NON-LINEAR LEAST SQUARES SUMMARY STATISTICS
                                       DEPENDENT VARIABLE TCA
                    DF SUM OF SQUARES MEAN SQUARE 4 28537.332819 7134.333205
  SOURCE
  REGRESSION
  RESIDUAL
                     2 83.825206
                                        41.912603
  UNCORRECTED TOTAL 6 28621.158025
  (CORRECTED TOTAL) 5 7732.207921
```

| PARA | METER | ES | TIMATE | ASYMPT | OTIC | ASYM | PTOTIC 95 % |
|------|-----------|--------|-----------|----------|---------|------------|---------------|
| | | | | STD. E | RROR | CONFIDE | ENCE INTERVAL |
| | | | | | | LOWER | UPPER |
| Α | | 2.161 | .801150 0 | .6196371 | .351350 | 431155141 | 4.8279138512 |
| В | | -0.402 | 137892 0 | .0940223 | 655580 | 668792457 | 0.0024121400 |
| С | | -0.015 | 704954 0 | .0623373 | 910028 | 392404580 | 0.2525141387 |
| D | | 0.002 | 839980 0 | .0120449 | 843604 | 1898597396 | 0.0546659345 |
| | | | | | | | |
| LOT | $X\Gamma$ | UX | R | AUC | UCP | DIF | PCT |
| 1 | 0 | 15 | 1.00000 | 1.551 | 1.20108 | 0.349915 | 22.561 |
| 2 | 15 | 85 | 4.66667 | 0.379 | 0.45504 | -0.076040 | -20.063 |
| 3 | 85 | 295 | 3.00000 | 0.228 | 0.24236 | -0.014356 | -6.296 |
| 4 | 295 | 505 | 1.00000 | 0.195 | 0.18112 | 0.013883 | 7.120 |
| 5 | 505 | 1255 | 3.57143 | 0.130 | 0.12610 | 0.003903 | 3.002 |
| 6 | 1255 | 2565 | 1.74667 | 0.090 | 0.09102 | -0.001020 | -1.133 |

C.9 - Basic Learning Curve Non-linear Regression

This section contains the summary results produced by the non-linear regression procedure in SAS. The SAS program used to produce this run was discussed in Appendix B.9.

C.9.1 - Bomber Aircraft Programs

| | | | SYS=B-1B | | |
|---------------|-------------|---------|----------|--------------|-------------------|
| NON-LINEAR LE | AST SQUARES | SUMMARY | STATIST | ics depeni | DENT VARIABLE TCA |
| SOURCE | | DF SUM | OF SQUAR | es mean so | UARE |
| REGRESSION | | 2 59 | 459243.5 | 99 29729621 | 1.800 |
| RESIDUAL | | 3 | 18733.2 | 11 6244 | 1.404 |
| UNCORRECTE | D TOTAL | 5 59 | 477976.8 | 10 | |
| | | | | | |
| (CORRECTED | TOTAL) | 4 17 | 234615.0 | 32 | |
| PARAMETER | ESTIMAT | E ASY | MPTOTIC | ASYM | PTOTIC 95 % |
| | | STD | . ERROR | CONFID | ENCE INTERVAL |
| | | | | LOWER | |
| A | | | 0158123 | 341.58094132 | 453.54229778 |
| В | -0.294490 | 4 0.01 | 1736989 | -0.33184339 | -0.25713745 |
| | | | | | |
| LOT XL | XU , | AUC | UCP | DIF | PCT |
| | | | | | |
| 1 0 | | 535.8 | 563.503 | -27.703 | -5.1705 |
| 2 1 | | 260.3 | | -8.292 | |
| 3 8 | | 200.5 | 188.655 | 11.845 | 5.9079 |
| 4 18 5 52 | 52 | 142.0 | 141.844 | 0.156 | 0.1100 |
| 5 52 | 100 | 111.3 | 111.783 | -0.483 | -0.4338 |

NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA
 SOURCE
 DF
 SUM OF SQUARES
 MEAN SQUARE

 REGRESSION
 2
 69617419.295
 34808709.647

 RESIDUAL
 8
 2783352.615
 347919.077

 UNCORRECTED TOTAL
 10
 72400771.910
 (CORRECTED TOTAL) 9 18070289.989 PARAMETER ESTIMATE ASYMPTOTIC ASYMPTOTIC 95 % STD. ERROR CONFIDENCE INTERVAL LOWER 95.12495044 42.528246791 -2.9463086649 193.19620954 -0.21081760 0.079539299 -0.3942373265 -0.02739788 LOT XL XU AUC UCP DIF PCT

 1
 0
 20
 112.5
 64.0969
 48.4031
 43.025

 2
 20
 63
 37.0
 43.9196
 -6.9196
 -18.702

 3
 63
 88
 28.6
 38.2738
 -9.6738
 -33.824

 4
 88
 165
 32.3
 34.4274
 -2.1274
 -6.586

 5
 165
 298
 23.4
 30.2952
 -6.8952
 -29.467

 6
 298
 500
 28.4
 26.9882
 1.4118
 4.971

 7
 500
 601
 27.3
 25.1565
 2.1435
 7.852

 8
 601
 640
 27.3
 24.5219
 2.7781
 10.176

 9
 640
 702
 35.4
 24.1219
 11.2781
 31.859

 10
 702
 742
 35.0
 23.7508
 11.2492
 32.141

 10 -----SYS=B-58-----NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA DF SUM OF SQUARES MEAN SQUARE 2 13658345.536 6829172.768 2 579983.338 289991.669 SOURCE REGRESSION RESIDUAL UNCORRECTED TOTAL 4 14238328.874 (CORRECTED TOTAL) 3 1830393.074 ASYMPTOTIC 95 % PARAMETER ESTIMATE ASYMPTOTIC STD. ERROR CONFIDENCE INTERVAL LOWER UPPER Α 157.0740981 75.105407035 -166.08193672 480.23013298 XU AUC UCP DIF PCT 17 93.86 105.742 -11.882 -12.659 LOT XL XU AUC 1 0 53 80.26 69.434 10.826 13.489 73 73.16 59.758 13.402 18.319 103 36.56 55.281 -18.721 -51.207 2 17 3 53

73 103 36.56

C.9.2 - Fighter Aircraft Programs

| | | | SYS | S=A-10 | | | |
|------------------------|------------|--------------------|-----------------------|-------------------------------|---|---------------------------------|--|
| NON-LINEAR L | EAST SO | UARES S | SUMMARY S | STATISTICS | DEPENDENT | VARIABLE TCA | |
| SOURCE REGRESSIO | N | Γ | OF SUM OF 2 5143 | SQUARES 8666.2635 | MEAN SQUAR 2571833.131 | E 7 | |
| UNCORRECT | ED TOTA | AL. | 9 5187 | 7217.3844 | 2571833.131 6221.588 | 1 | |
| (CORRECTE | D TOTAL | ٠) | 8 1226 | 6666.3049 | | | |
| PARAMETER | ES | STIMATE | | PTOTIC ERROR | ASYMPTOTIC 95 % CONFIDENCE INTERVAL LOWER UPPER | | |
| A B | | | | | 256992951 17 526742658 0 | .469957183 | |
| LOT | XL | XU | AUC | NCE | DIF | PCT | |
| 1 2 3 | 22 | 22 75 95 | 12.37 9.16 8.20 | 9.50007 8.76264 8.51770 | | 4.3380 | |
| 4 5 | 95 195 | 195 339 | 8.20 7.82 | 8.31830 8.08476 | -0.11830 -0.26 4 76 | -1.4427 -3.3857 | |
| 7 | 339 483 | 627 | 7.82 | 7.81356 | -0.33317 0.00644 | 0.0823 | |
| | | | | | 2.42776 5.90893 | | |
| | | | SYS= | F-100 | | | |
| NON-LINEAR L | EAST SO | UARES S | SUMMARY S | TATISTICS | DEPENDENT | VARIABLE TCA | |
| SOURCE | vr. | ľ | F SUM OF | SQUARES | MEAN SQUAR | E | |
| REGRESSION RESIDUAL | N | | 3 4 | 1025.670 | 5897307.59 13675.22 | 3 | |
| UNCORRECT | ED TOTA | Ţ | 5 1183 | 15640.869 | | | |
| (CORRECTE | D TOTAL | .) | 4 208 | 6478.767 | | | |
| PARAMETER | ES | TIMATE | | TOTIC ERROR | •• | TIC 95 % E INTERVAL UPPER | |
| A B | | 2601084 3747451 | | 81180 1.12 94559 -0.23 | 235912984 11 | .921610870 .010495618 | |
| LOT | XL | ΧΩ | AUC | UCP | DIF | PCT | |
| 1 2 | 0 23 | 23 568 | 6.51 3.45 | 5.15193 3.51092 | 1.35807 -0.06092 | 20.8612 -1.7657 | |

| | 3 | 568 | 1161 1720 | | 3.08 | | 3.0 | 303 | 5 | 0.049 | 965 | 1.6120 | |
|------|---------------|---------|--------------|-----|------------|--------------|-------------------|---------|--------------|------------|------------|---------------------------------|-----|
| | 4 5 | 1720 | 2277 | | 2.50 | | $\frac{2.0}{2.7}$ | 488 | .9 .6 | -0.248 | 386 386 | -9.9546 | |
| | J | 2,20 | | | | | | | | | | | |
| | | | | | S | (S=I | ?-10 | 1 | | | | | |
| NON- | LINEAR | LEAST | SQUARES | SU | MMAR | (S | ITATI | STI | CS | DEPI | ENDENT | VARIABLE | TCA |
| S | OURCE | | | DF | SUM | OF | SQU | ARE | S | MEAN | SQUARE | G | |
| R | EGRESSI | ON | | 2 | 70 | 509 | 997. | 429 | 2 | 352549 | 98.7146 | 5 | |
| R | ESIDUAL | | OTAL | 4 | | 258 | 362. | 415 | 4 | 646 | 55.6038 | 3 | |
| U | NCORREC | TED TO | OTAL | 6 | 70 |)768 | 359. | 844 | 6 | | | | |
| (| CORRECT | ED TO | ral) | 5 | 22 | 500, | 718. | 464 | 3 | | | | |
| - | | | Dom: Vam | _ | | n (D) | nom= | _ | | • | | | |
| P | ARAMETE | ĸ | ESTIMAT | Ľ | AS) | (MLP)) I | יסם יסטיו | C ND | | AX CONT | SYMPTOI | ric 95 % E intervai | |
| | | | | | 011 | | <i></i> (1) | 41 | | LOW | | UPPE | |
| A | | 23. | .8026703 | 9 | 5.040 |)430 | 0523 | 5 | 9.80 | | | 796959692 | |
| В | | -0. | .2269410 | 0 | 0.03 | 795. | 1894 | 9 - | 0.33 | 231092 | 30 -0. | .12157107 | 4 |
| | LOT | ' > | CT XI | IJ | A U | JC | | U | CP CP | | DIF | PC | r |
| | 1 | | 0 3: | 1 | 16. | 85 | | 14. | 1241 | 2 | 7259 | 16.17 | 7 |
| | 2 | | 31 11 | | 7. | 58 | | 9. | 1482 | -1 | | -20.689 | 3 |
| | 3 | 1.1 | 15 42 | 4 | 6. | .91 | | 6. | 8006 | 0. | 1094 | 1.58 | 4 |
| | 4 | 42 | | | 5. | 76 | | 5. | 7506 | 0. | .0094 | 0.163 | 3 |
| | 5 | 63 | | 4 | 5. | . 27 | | 5. | 4332 2828 | -0. | .1632 | | |
| | 6 | 71 | 14 80 | 7 | 5. | . 22 | | 5. | 2828 | -0 | .0628 | -1.20 | 2 |
| | | | | | s | (S=I | -10 | 2 | | | | | |
| NON- | LINEAR | LEAST | SQUARES | SUI | MMAR) | C S! | rati | STI | CS | DEPI | ENDENT | VARIABLE | TCA |
| q | | | | ਜਹ | SLIM | OF. | SOL | IARF | ' S | MEAN | SOLIARE | 7. | |
| R | EGRESSI | ON | | 2 | 4 | 153° | 106. | 420 | 9 | 22265 | 53.2105 | 5 | |
| | ESIDUAL | | | 2 | | 91 | 500. | 045 | 1 | 480 | 0.0225 | 5 | |
| | NCORREC | | OTAL | | | | 706. | | | | | | |
| (| CORRECT | ED TO | TAL) | 3 | 1 | 795' | 723. | 517 | 9 | | | | |
| P | ARAMETE | IR | ESTIMAT | E | | | roti Erro | | | | FIDENCE | ric 95 % E interval Upper | |
| A | | 24 | . 4964477 | 8 | 5,520 | 000 | 5606 | 8 0 | .745 | | | . 24737590 | - |
| В | | | | | | | | | | | | 16054735 | |

| LOT | XT | υχ | AUC | UCP | DIF | PCT | | | | | | |
|--|------------------|-------------------|--------------------------------------|--------------------------------------|---------------------------------------|--|--|--|--|--|--|--|
| 1 2 3 4 | 37 145 | 145 707 | 5.17 3.50 | 5.6942 3.4506 | -0.5241 0.0494 | 1 4.769 8 -10.139 3 1.412 8 -23.307 | | | | | | |
| SYS=F-106 | | | | | | | | | | | | |
| NON-LINEAR | LEAST SQU | JARES SU | mmary sta | TISTICS | DEPENDEN | T VARIABLE TCA | | | | | | |
| SOURCE REGRESS: RESIDUAI UNCORREC | | DF 2 2 4 | SUM OF S 471669 4838 476507 | QUARES 5.7571 3.1162 8.8733 | MEAN SQUA 2358347.87 24191.55 | RE 85 81 | | | | | | |
| (CORRECT | TED TOTAL |) 3 | 48090 | | | | | | | | | |
| PARAMETI | | | ASYMPTO STD. ER | | LOWER | | | | | | | |
| A B | | | | | | 85.52286948 -0.29879843 | | | | | | |
| LOT | XL | ΧU | AUC | UCP | DIF | PCT | | | | | | |
| 1 2 3 4 | 42 130 175 | 130 175 340 | 10.54 11.64 7.59 | 12.4638 9.1230 7.1389 | 0.8767 -1.9238 2.5170 0.4511 | -18.252 21.623 5.943 | | | | | | |
| | | | SYS= | F-15AB | | | | | | | | |
| NON-LINEAR | LEAST SQU | JARES SU | MMARY STA | TISTICS | DEPENDEN | T VARIABLE TCA | | | | | | |
| SOURCE REGRESS: RESIDUAI UNCORREA | ION | 2 4 | 102406 | 31.316 10.743 | MEAN SQUA 5120315.6 1752.6 | 58 | | | | | | |
| (CORRECT | TED TOTAL |) 5 | 15859 | 18.021 | | | | | | | | |
| PARAMETI | er est | TIMATE | ASYMPTO STD. ERI | - | | OTIC 95 % CE INTERVAL UPPER | | | | | | |
| A B | | | | | 95737787 3 | 8.711583030 0.076771783 | | | | | | |
| LOT | XL | ΧŪ | AUC | UCP | DI | F PCT | | | | | | |
| 1 2 | 0 30 | 30 92 | 25.597 19.556 | | | | | | | | | |

| | 4 5 | 164 272 | 272 296 | 17.126 16.021 | 16.9650 16.4224 | -0.88792 0.16104 -0.40144 | 0.9403 -2.5057 |
|----|---|-------------------------|-------------------|---|--|---|---------------------------------------|
| | 6 | 296 | 404 | 16.272 | 16.0308 | 0.24120 | 1.4823 |
| | | | | SYS=F-1 | 5CD | | |
| NO | N-LINEAR LEA | AST SQUA | RES SU | MMARY STAT | ISTICS | DEPENDENT V | ARIABLE TCA |
| | SOURCE REGRESSION RESIDUAL UNCORRECTED |) TOTAL | DF 2 6 8 | SUM OF SQI 8333341 85507 8418849 | UARES .5389 4 .6073 .1462 | MEAN SQUARE 1166670.7695 14251.2679 | |
| | (CORRECTED | TOTAL) | 7 | 752208 | .0946 | | |
| | PARAMETER | ESTI | MATE | ASYMPTOT | IC OR | ASYMPTOTI CONFIDENCE LOWER | C 95 % INTERVAL UPPER |
| | A B | | | | | 5360664 21.0 9911924 0.1 | 29724456 |
| | LOT | ХГ | XU | AUC | UCP | DIF | PCT |
| | 2 3 4 5 | 97 175 235 277 | 235 277 313 | 17.665 19.943 | 17.5503 17.9520 18.1704 18.3102 | -2.4440 -0.5054 1.6328 | -12.588 -15.760 -2.861 8.187 |
| | 6 7 8 | 352 | 388 | 21.954 | 18.4287 18.5352 18.6427 | | 4.554 15.573 11.297 |
| | | | | SYS=F-1 | 5tr | | |
| NO | n-Linear Lea | LST SQUA | | | | DEPENDENT (| ARIABLE TCA |
| | SOURCE RECRESSION RESIDUAL UNCORRECTED | TOTAL | DF 2 4 6 | 3478 | 2.955 3.582 | MEAN SQUARE 6998996.478 8695.895 | |
| | (CORRECTED | TOTAL) | 5 | 17234 | 6.387 | | |
| | PARAMETER | ESTI | MATE | ASYMPTOT: STD. ERRO | | ASYMPTOTI CONFIDENCE LOWER | |
| | A B | 25.3553 -0.0695 | | | | 35.4 394417 0.0 | 185647068 |

| LOT | XL | ΧU | AUC | UCP | DIF | PCT |
|----------------|----------|------------|-----------------|-------------------|-----------------------------|--------------|
| • | 0 | 60 | 20 544 | 20 405 | 8 0.0482 | 2 0 2247 |
| 1 | | | | | 8 0.7131 | |
| | 60 | | 19.203 | | | |
| 3 | 132 | | 17.608 | | 2 -0.0741 | |
| | | | 16.175 | _ | 0 -0.9800 | |
| 5 | 324 | 420 | 16.041 | 16.799 | 5 -0.7585 | 0 -4.7285 |
| | 420 | 516 | 17.927 | 16.532 | 0 1.3949 | 9 7.7815 |
| | | | | | | |
| | | | <i>-</i> SYS=F- | -16 A B | | |
| NON-LINEAR LEA | AST SQUA | ARES SU | mmary sti | ATISTICS | DEPENDENT | VARIABLE TCA |
| SOURCE | | DF | F SUM OF S | SQUARES | MEAN SQUAR | Ξ |
| REGRESSION | | 2 | 2 547543 | l6.1108 | 2737708.055 | 4 |
| RESIDUAL | | 3 | 10262 | 20.6292 | 34206.876 | 4 |
| UNCORRECTE | TOTAL | 5 | 55780 | 36.7400 | 2737708.055 34206.876 | |
| (CORRECTED | TOTAL) | 4 | 33802 | 23.5480 | | |
| PARAMETER | רייים | матте | a cvmpny | אייז <i>רי</i> | λ CVMDͲΩ | rτ~ α5 % |
| LWW. IETEW | ESII | THIE | WOILE I | | ASYMPTO CONFIDENCE | T T |
| | | | STO. EX | ROR | | |
| | | | | | LOWER | UPPER |
| | | | | | 60468231 49 | |
| В | -0.2070 | 7532 | 0.0718796 | 5714 -0.43 | 58323696 0 | .021681739 |
| LOT | XL X | Œ | AUC | UCE | DIF | PCT |
| | | | | | | |
| 1 | 0 | 105 | 10.14 | 10.6199 | -0.4799 | -4.733 |
| 2 | 105 | 250 | 7.74 | 7.6092 | 0.1308 1.4088 -1.0160 | 1.689 |
| 3 | 250 | 425 | 8.04 | 6.6312 | 1.4088 | 17.522 |
| 4 | 425 | 425 605 | 5.05 | 6 0660 | -1 0160 | -20 119 |
| | 605 | 725 | 5.13 | 5 7470 | -0.6178 | -12 043 |
| J | 003 | 123 | 3.13 | 3.7470 | -0.0178 | -12.043 |
| | | | SYS=F- | -16E | | |
| NON-LINEAR LEA | AST SQUA | ARES SU | MMARY ST | ATISTICS | DEPENDENT | VARIABLE TCA |
| SOURCE | | DF | SUM OF S | OUARES | MEAN SQUAR | 2 |
| REGRESSION | | 2 | | 708.478 | 23834354.23 | |
| RESIDUAL | | 8 | | 137.145 | 43517.14 | |
| UNCORRECTE | T COURT | | | 345.623 | 43311.14 | , |
| ONCORRECTE |) TOTAL | 10 | 40016 | 343.023 | | |
| (CORRECTED | TOTAL) | 9 | 17470 | 28.765 | | |
| PARAMETER | ESTI | MATE | ASYMPTO | אדו כ | λ ςΥΜΡΤΥΥ | ric 95 % |
| | | | STD. EF | | | E INTERVAL |
| | | | OID. ER | T/OK | LOWER | UPPER |
| 1 | 10 0000 | 2442 | 2 022005 | 1401 5 00 | | |
| A | | | | | 12566788 19 | |
| В | -0.0211 | . /649 | 0.0350270 | J408 -0.10 | 19497728 0 | .059596788 |

| LOT | XL | χU | AUC | UCP | DIF | PCT |
|-----|------|------|-------|---------|---------|---------|
| 1 | 0 | 120 | 9.86 | 11.8462 | -1.9862 | -20.144 |
| 2 | 120 | 264 | 10.58 | 11.4866 | -0.9066 | -8.569 |
| 3 | 264 | 414 | 14.55 | 11.3451 | 3.2049 | 22.027 |
| 4 | 414 | 630 | 11.93 | 11.2416 | 0.6884 | 5.770 |
| 5 | 630 | 846 | 11.28 | 11.1586 | 0.1214 | 1.076 |
| 6 | 846 | 1062 | 11.02 | 11.0978 | -0.0778 | -0.706 |
| 7 | 1062 | 1278 | 10.88 | 11.0497 | -0.1697 | -1.560 |
| 8 | 1278 | 1494 | 10.69 | 11.0101 | -0.3201 | -2.994 |
| 9 | 1494 | 1710 | 10.61 | 10.9763 | -0.3663 | -3.452 |
| 10 | 1710 | 1926 | 10.54 | 10.9469 | -0.4069 | -3.860 |

C.9.2 - Electronics Programs

-----SYS=ARC-109V------

| | | | | | | | - | | | | |
|----------------------|-------|----------|---------|---------|------|------|---------|---------|--------|--------|----------|
| NON-LINEAR LE | EAST | SQUARES | SUN | MARY | STA | TIST | rics | DEPEN | IDENT | VARI | ABLE TCA |
| SOURCE REGRESSION | N | 1 | DF 2 | | 650 | 2509 | 587 | MEAN 3 | 2529 | 4 | |
| RESIDUAL | | | 3 | | .093 | 8233 | 143 | 0.0312 | 274382 | l | |
| UNCORRECT | ED TO | TAL | 5 | 66. | .744 | 073 | 730 | | | | |
| | | | | | | | | | | | |
| (CORRECTE | TOT C | AL) | 4 | 29. | .010 | 1828 | 332 | | | | |
| PARAMETER | | estimate | | ASYN | | | | | MPTO | | |
| | | | | STD. | . Er | ROR | | CONF | DENC | E INT | ERVAL |
| | | | | | | | | LOWER | ₹ | | UPPER |
| A | 0.03 | 11517458 | 0 | .00711 | L689 | 517 | 0.0085 | 0222688 | 0.05 | 53801 | 26466 |
| В | 00 | 12134599 | 0 | .04277 | 7992 | 471 | 1373 | 6057031 | 0.13 | 34933 | 65047 |
| 2 | | | Ĭ | | | | | | | | |
| LOT | ХL | ΧU | | AUC | | | UCEP | | I | OIF | PCT |
| 1 | 0 | 4 | (| 0.0487 | 7 | 0.0 | 0311372 | 0. | 0175 | 528 | 36.0633 |
| 2 | 4 | 28 | (| 0.0393 | 3 | 0.0 | 0310515 | . 0. | 00824 | 485 | 20.9886 |
| 2 3 | 28 | 107 | (| 0.0285 | 5 | 0.0 | 0309953 | -0. | 00249 | 953 | -8.7556 |
| 4 | 107 | 333 | | 0.0313 | | | 0309503 | | 0003 | | 1.1172 |
| 5 | 333 | 441 | | 0.0303 | | | 0309274 | | 0006 | | -2.0708 |
| 5 | 555 | 44T | , | J. 030. | , | 0.0 | 0303217 | -0, | . 0000 | L 1 -1 | 2.0700 |
| | | | | - | | | | | | | |

-----SYS=ARC-54-----

NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA

| SOURCE REGRESSION RESIDUAL UNCORRECTED TOTAL | DF 2 5 7 | SUM OF SQUARES 4660.0577861 6.1431566 4666.2009427 | MEAN SQUARE 2330.0288930 1.2286313 |
|---|-------------------|---|--|
| (CORRECTED TOTAL) | 6 | 1109.4069615 | |

| PARAME | PARAMETER ESTIMATE | | | POTIC ERROR | ASYMPTOTIC CONFIDENCE I LOWER | |
|--|---|---|--|---|--|---|
| A | 0.04 | 400966747 | 0.006039 | 10116 0.0245 | 7289599 0.0556 | |
| В | | | | | 43640510722 | |
| LOT | XL | XU | AUC | UCP | DIF | PCT |
| 1 | 0 | 900 | 0.0210 | 0.0203585 | 0.00064148 | 3.0547 |
| 2 | 900 | 1753 | 0.0165 | 0.0171902 | -0.00069016 | -4.1828 |
| 3 | 1753 | 3134 | 0.0164 | 0.0159847 | 0.00041534 | 2.5326 |
| 4 | 3134 | 4294 | 0.0145 | 0.0151942 | -0.00069418 | -4.7874 |
| 5 | 4294 | 4594 | 0.0144 | 0.0148678 | -0.00046784 | -3.2489 |
| 5 6 | 4594 | | | 0.0143295 | -0.00042946 | -3.0897 |
| 7 | 7697 | | 0.0143 | 0.0136811 | 0.00061894 | 4.3283 |
| | | | sys= | ASN-63 | | |
| NON-LINEA | R LEAST | SQUARES | SUMMARY S' | TATISTICS | DEPENDENT VA | RIABLE TCA |
| SOURCE | | , | DF SUM OF | COLDADEC | MEAN SQUARE | |
| REGRES | | | | 8.765769 | 13854.382885 | |
| RESIDU | | | | 3.199227 | 4.149903 | |
| | | OMAT. | | | 4.149903 | |
| UNCORR | ECTED TO | JIAL . | 10 2774 | 1.964996 | | |
| (CORRE | CTED TO | ral) | 9 1479 | 4.094157 | | |
| | | | | | | |
| PARAME | TER | ESTIMATE | ASYMP' | TOTIC | ASYMPTOTIC | 95 % |
| PARAME | TER | ESTIMATE | ASYMP | | ASYMPTOTIC CONFIDENCE I | |
| PARAME | TER | ESTIMATE | ASYMP' | | ASYMPTOTIC CONFIDENCE I LOWER | |
| | - | | STD. I | ERROR | CONFIDENCE I LOWER | NTERVAL UPPER |
| A | 0.18 | 373636108 | STD. 1 | TROR 72886 0.1366 | CONFIDENCE I LOWER 51090141 0.2381 | NTERVAL UPPER 1632018 |
| | 0.18 | 373636108 | STD. 1 | TROR 72886 0.1366 | CONFIDENCE I LOWER | NTERVAL UPPER 1632018 |
| A B | 0.18 | 373636108 | STD. 1 | TROR 72886 0.1366 | CONFIDENCE I LOWER 51090141 0.2381 | NTERVAL UPPER 1632018 |
| A B LOT | 0.18 00 XL | 373636108 011536203 XU | STD. I 0.022008 0.019456 | ERROR 72886 0.1366 467010460 UCP | CONFIDENCE I LOWER 51090141 0.2381 02074654 0.0437 | NTERVAL UPPER 1632018 1350595 |
| A B LOT 1 | 0.18 00 XL 0 | 373636108 011536203 XU 781 | STD. I 0.022008 0.019456 AUC 0.1866 | TROR 72886 0.1366 467010460 UCP 0.186144 | CONFIDENCE I LOWER 51090141 0.2381 02074654 0.0437 DIF 0.000456 | NTERVAL UPPER 1632018 1350595 PCT 0.2443 |
| A B LOT 1 2 | 0.18 00 XL 0 781 | 373636108 011536203 XU 781 930 | STD. I 0.022008 0.019456 AUC 0.1866 0.1744 | TROR 72886 0.1366 467010460 UCP 0.186144 0.185910 | CONFIDENCE I LOWER 1090141 0.2381 22074654 0.0437 DIF 0.000456 -0.011510 | NTERVAL UPPER 1632018 1350595 PCT 0.2443 -6.5999 |
| A B LOT 1 2 3 | 0.18 00 XL 0 781 930 | 373636108 011536203 XU 781 930 1217 | STD. I 0.022008 0.019456 AUC 0.1866 0.1744 0.1769 | TROR 72886 0.1366 467010460 UCP 0.186144 0.185910 0.185862 | CONFIDENCE I LOWER 51090141 0.2381 52074654 0.0437 DIF 0.000456 -0.011510 -0.008962 | NTERVAL UPPER 1632018 1350595 PCT 0.2443 -6.5999 -5.0661 |
| A B LOT 1 2 3 4 | 0.18 00 XL 0 781 930 1217 | 373636108 011536203 XU 781 930 1217 1358 | AUC 0.1866 0.1744 0.1769 0.1817 | UCP 0.186144 0.185910 0.185862 0.185822 | CONFIDENCE I LOWER 51090141 0.2381 52074654 0.0437 DIF 0.000456 -0.011510 -0.008962 -0.004122 | NTERVAL UPPER 1632018 1350595 PCT 0.2443 -6.5999 -5.0661 -2.2688 |
| A B LOT 1 2 3 4 5 | 0.18 00 XL 0 781 930 1217 1358 | 373636108 311536203 XU 781 930 1217 1358 1450 | AUC 0.1866 0.1744 0.1769 0.1817 0.1772 | UCP 0.185910 0.185862 0.185804 | CONFIDENCE I LOWER 51090141 0.2381 52074654 0.0437 DIF 0.000456 -0.011510 -0.008962 -0.004122 -0.008604 | NTERVAL UPPER 1632018 1350595 PCT 0.2443 -6.5999 -5.0661 -2.2688 -4.8554 |
| A B LOT 1 2 3 4 5 6 | 0.18 00 XL 0 781 930 1217 1358 1450 | 373636108 311536203 XU 781 930 1217 1358 1450 1585 | AUC 0.1866 0.1744 0.1769 0.1817 0.1772 0.2189 | UCP 0.185910 0.185862 0.185804 0.185787 | CONFIDENCE I LOWER 51090141 0.2381 52074654 0.0437 DIF 0.000456 -0.011510 -0.008962 -0.004122 -0.008604 0.033113 | NTERVAL UPPER 1632018 1350595 PCT 0.2443 -6.5999 -5.0661 -2.2688 -4.8554 15.1269 |
| A B LOT 1 2 3 4 5 6 7 | 0.18 00 XL 0 781 930 1217 1358 1450 1585 | 373636108 311536203 XU 781 930 1217 1358 1450 1585 1693 | AUC 0.1866 0.1744 0.1769 0.1817 0.1772 0.2189 0.1911 | UCP 0.186144 0.185910 0.185862 0.185822 0.185771 | CONFIDENCE I LOWER 51090141 0.2381 52074654 0.0437 DIF 0.000456 -0.011510 -0.008962 -0.004122 -0.008604 0.033113 0.005329 | NTERVAL UPPER 1632018 1350595 PCT 0.2443 -6.5999 -5.0661 -2.2688 -4.8554 15.1269 2.7888 |
| A B LOT 1 2 3 4 5 6 7 8 | 0.18 00 XL 0 781 930 1217 1358 1450 1585 1693 | 373636108 311536203 XU 781 930 1217 1358 1450 1585 1693 1851 | AUC 0.1866 0.1744 0.1769 0.1817 0.1772 0.2189 0.1911 0.1917 | UCP 0.186144 0.185910 0.185862 0.185822 0.185804 0.185771 0.185754 | CONFIDENCE I LOWER 51090141 0.2381 52074654 0.0437 DIF 0.000456 -0.011510 -0.008962 -0.004122 -0.008604 0.033113 0.005329 0.005946 | NTERVAL UPPER 1632018 1350595 PCT 0.2443 -6.5999 -5.0661 -2.2688 -4.8554 15.1269 2.7888 3.1018 |
| A B LOT 1 2 3 4 5 6 7 8 9 | 0.18 00 XL 0 781 930 1217 1358 1450 1585 1693 1851 | 373636108 311536203 XU 781 930 1217 1358 1450 1585 1693 1851 1887 | AUC 0.1866 0.1744 0.1769 0.1817 0.1772 0.2189 0.1911 0.1917 0.2005 | UCP 0.186144 0.185910 0.185862 0.185822 0.185804 0.185771 0.185754 0.185742 | CONFIDENCE I LOWER 51090141 0.2381 52074654 0.0437 DIF 0.000456 -0.011510 -0.008962 -0.004122 -0.008604 0.033113 0.005329 0.005946 0.014758 | NTERVAL UPPER 1632018 1350595 PCT 0.2443 -6.5999 -5.0661 -2.2688 -4.8554 15.1269 2.7888 3.1018 7.3604 |
| A B LOT 1 2 3 4 5 6 7 8 9 | 0.18 00 XL 0 781 930 1217 1358 1450 1585 1693 | 373636108 311536203 XU 781 930 1217 1358 1450 1585 1693 1851 1887 | AUC 0.1866 0.1744 0.1769 0.1817 0.1772 0.2189 0.1911 0.1917 | UCP 0.186144 0.185910 0.185862 0.185822 0.185804 0.185771 0.185754 0.185742 | CONFIDENCE I LOWER 51090141 0.2381 52074654 0.0437 DIF 0.000456 -0.011510 -0.008962 -0.004122 -0.008604 0.033113 0.005329 0.005946 | NTERVAL UPPER 1632018 1350595 PCT 0.2443 -6.5999 -5.0661 -2.2688 -4.8554 15.1269 2.7888 3.1018 7.3604 |
| A B LOT 1 2 3 4 5 6 7 8 9 | 0.18 00 XL 0 781 930 1217 1358 1450 1585 1693 1851 1887 | 373636108 011536203 XU 781 930 1217 1358 1450 1585 1693 1851 1887 1923 | AUC 0.1866 0.1744 0.1769 0.1817 0.1772 0.2189 0.1911 0.1917 0.2005 0.2145 | UCP 0.186144 0.185910 0.185862 0.185822 0.185804 0.185771 0.185771 0.185742 0.185738 | CONFIDENCE I LOWER 51090141 0.2381 52074654 0.0437 DIF 0.000456 -0.011510 -0.008962 -0.004122 -0.008604 0.033113 0.005329 0.005946 0.014758 | NTERVAL UPPER 1632018 1350595 PCT 0.2443 -6.5999 -5.0661 -2.2688 -4.8554 15.1269 2.7888 3.1018 7.3604 13.4087 |
| A B LOT 1 2 3 4 5 6 7 8 9 | 0.18 00 XL 0 781 930 1217 1358 1450 1585 1693 1851 1887 | XU 781 930 1217 1358 1450 1585 1693 1851 1887 1923 | AUC 0.1866 0.1744 0.1769 0.1817 0.1772 0.2189 0.1911 0.1917 0.2005 0.2145 | UCP 0.186144 0.185910 0.185862 0.185822 0.185804 0.185787 0.185771 0.185754 0.185742 0.185738 | CONFIDENCE I LOWER 51090141 0.2381 52074654 0.0437 DIF 0.000456 -0.011510 -0.008962 -0.004122 -0.008604 0.033113 0.005329 0.005946 0.014758 0.028762 | NTERVAL UPPER 1632018 1350595 PCT 0.2443 -6.5999 -5.0661 -2.2688 -4.8554 15.1269 2.7888 3.1018 7.3604 13.4087 |
| A B LOT 1 2 3 4 5 6 7 8 9 10 | 0.18 00 XL 0 781 930 1217 1358 1450 1585 1693 1851 1887 | 373636108 373636108 311536203 XU 781 930 1217 1358 1450 1585 1693 1851 1887 1923 | STD. I 0.022008 0.019456 AUC 0.1866 0.1744 0.1769 0.1817 0.1772 0.2189 0.1911 0.1917 0.2005 0.2145 SYS=A | UCP 0.186144 0.185910 0.185862 0.185822 0.185804 0.185771 0.185771 0.185754 0.185738 0.185738 | CONFIDENCE I LOWER 51090141 0.2381 52074654 0.0437 DIF 0.000456 -0.011510 -0.008962 -0.004122 -0.008604 0.033113 0.005329 0.005946 0.014758 0.028762 | NTERVAL UPPER 1632018 1350595 PCT 0.2443 -6.5999 -5.0661 -2.2688 -4.8554 15.1269 2.7888 3.1018 7.3604 13.4087 |
| A B LOT 1 2 3 4 5 6 7 8 9 10 NON-LINEAL | 0.18 00 XL 0 781 930 1217 1358 1450 1585 1693 1851 1887 | 373636108 373636108 311536203 XU 781 930 1217 1358 1450 1585 1693 1851 1887 1923 | STD. I 0.022008: 0.019456: AUC 0.1866 0.1744 0.1769 0.1817 0.1772 0.2189 0.1911 0.1917 0.2005 0.2145SYS=: SUMMARY ST | UCP 0.186144 0.185910 0.185862 0.185862 0.185804 0.185771 0.185771 0.185774 0.185738 0.185738 ASN-70 | CONFIDENCE I LOWER 51090141 0.2381 52074654 0.0437 DIF 0.000456 -0.011510 -0.008962 -0.004122 -0.008604 0.033113 0.005329 0.005946 0.014758 0.028762 DEPENDENT VA | NTERVAL UPPER 1632018 1350595 PCT 0.2443 -6.5999 -5.0661 -2.2688 -4.8554 15.1269 2.7888 3.1018 7.3604 13.4087 |
| A B LOT 1 2 3 4 5 6 7 8 9 10 | 0.18 00 XL 0 781 930 1217 1358 1450 1585 1693 1851 1887 | 373636108 373636108 311536203 XU 781 930 1217 1358 1450 1585 1693 1851 1887 1923 | STD. I 0.022008: 0.019456: AUC 0.1866 0.1744 0.1769 0.1817 0.1772 0.2189 0.1911 0.1917 0.2005 0.2145 SYS=: SUMMARY ST | UCP 0.186144 0.185910 0.185862 0.185862 0.185804 0.185771 0.185771 0.185774 0.185738 ASN-70 | CONFIDENCE I LOWER 51090141 0.2381 52074654 0.0437 DIF 0.000456 -0.011510 -0.008962 -0.004122 -0.008604 0.033113 0.005329 0.005946 0.014758 0.028762 DEPENDENT VA | NTERVAL UPPER 1632018 1350595 PCT 0.2443 -6.5999 -5.0661 -2.2688 -4.8554 15.1269 2.7888 3.1018 7.3604 13.4087 |

UNCORRECTED TOTAL 8 119,45599881 (CORRECTED TOTAL) 7 64.18968336 PARAMETER ESTIMATE ASYMPTOTIC ASYMPTOTIC 95 % STD. ERROR CONFIDENCE INTERVAL LOWER 0.0345300666 0.00129289467 0.03136646505 0.03769366818 Α В 0.0035818910 0.00702335300 -.01360364714 0.02076742906 LOT XL XU AUC UCP DIF PCT 0 152 0.0350 0.0350316 -0.0000316 -0.0902 1 152 402 0.0353 0.0352282 0.0000718 2 0.2035 402 483 0.0342 0.0352917 -0.0010917 3 -3.1921 541 0.0356 0.0353103 0.0002897 567 0.0370 0.0353203 0.0016797 4 483 0.8139 567 0.0370 5 541 4.5398 567 575 0.0399 0.0353241 6 0.0045759 11.4684 7 575 583 0.0370 0.0353259 0.0016741 4.5246 583 594 0.0427 0.0353279 0.0073721 17.2648 NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA SOURCE DF SUM OF SQUARES MEAN SQUARE REGRESSION 2 373.20568145 186.60284073 6 10.39792769 RESIDUAL 1.73298795 UNCORRECTED TOTAL 8 383.60360914 (CORRECTED TOTAL) 7 61.21154176 PARAMETER ESTIMATE ASYMPTOTIC ASYMPTOTIC 95 % STD. ERROR CONFIDENCE INTERVAL LOWER 0.0286102060 0.01535491364 -.00896194123 0.06618235333 Α В 0.0783227073 0.08833989279 -.13783737933 0.29448279389 LOT XL XU AUC UCP DIF PCT 0 157 0.0464 0.0394240 0.0069760 15.034 1 157 353 0.0404 0.0440759 -0.0036759 -9.099 3 353 538 0.0413 0.0461060 -0.0048060 -11.637 4 538 781 0.0433 0.0475500 -0.0042500 -9.815 5 781 805 0.0570 0.0482613 0.0087387 15.331 805 877 0.0624 0.0484830 0.0139170 22.303 877 933 0.0635 0.0487628 0.0147372 23.208 933 1050 0.0684 0.0491112 0.0192888 28.200 7 933 1050

| | | | 5 | VS=ASN-108 | | |
|-----------|----------------------------|-----------|---------|----------------------------|---------------------|-------------------|
| MOM T TAR | an Inac | | | | | |
| NON-LINE | AR LEAS | I SQUARES | SUMMAI | RY STATISTICS | DEPENDENT | VARIABLE TCA |
| SOURC | | | | M OF SQUARES | | |
| | SSION | | | 559.83537858 | | |
| RESID | | moma r | 3 | 0.79521666 560.63059524 | 0.26507222 | 2 |
| UNCOR | RECTED | TOTAL | 5 : | 560.63059524 | | |
| (CORR | ECTED T | OTAL) | 4 | 226.66710333 | | |
| PARAM | ETER | ESTIMAT | E AS | SYMPTOTIC | ASYMPTOT | TC 95 % |
| | | | S | TD. ERROR | CONFIDENCE LOWER | INTERVAL UPPER |
| A | ٥. | 107138802 | 1 0.02 | 368643872 0.01 | 3175671085 0.18 | |
| В | | | | | 5888351453 0.10 | |
| LOT | ХĽ | XU A | UC | UCP | DIF | PCT |
| 1 | 0 | 8 0 | .1373 | 0 104063 | 0.0332367 | 24.2074 |
| 2 | | • | _ | | 0.0062847 | |
| | | | | 0.095246 | | |
| 4 | | | | | 0.0017848 | |
| 5 | | | .0872 | 0.091051 | | -4.4158 |
| | | | | | | |
| | | | | SYS=ASQ-133 | | |
| NON-LINE | ar Leas' | T SQUARES | SUMMAR | RY STATISTICS | DEPENDENT | VARIABLE TCA |
| SOURC | E | | DF SUN | 1 OF SQUARES | MEAN SQUARE | |
| REGRE | | | | 2881.4910612 | 1440.7455306 | |
| RESID | | | 4 | | 0.8197588 | |
| UNCOR | RECTED ' | TOTAL | 6 2 | 2884.7700964 | | |
| (CORR | ECTED TO | OTAL) | 5 | 403.6845454 | | |
| PARAM | स्त्राच्याः स्त्राच्याः | ESTIMAT | F. 20.9 | SYMPTOTIC | ASYMPTOT | TC 95 % |
| | | 20111211 | | D. ERROR | CONFIDENCE | |
| | | | | | LOWER | UPPER |
| A | 0.8 | 827376304 | 1 0.079 | 92882397 0.60 | 546131471 1.0 | 492912935 |
| В | ; | 158845232 | 4 0.020 | 00662677821 | L455736956 -0.1 | 031330953 |
| LOT | XL | υx | AUC | UCP | DIF | PCT |
| 1 | 0 | 14 | 0.5856 | 0.646800 | -0.061200 | -10.451 |
| | 14 | 33 | 0.5862 | | 0.082445 | 14.064 |
| 2 3 | 33 | 101 | 0.4255 | | -0.002460 | -0.578 |
| 4 | 101 | 168 | 0.3828 | 0.380548 | 0.002252 | 0.588 |
| 5 | 168 | 249 | 0.3535 | | -0.001177 | -0.333 |
| 6 | 249 | 307 | 0.3355 | 0.338551 | -0.003051 | -0.909 |
| | | | | | | |

-----SYS=ASW-32------

| | | | | ⊃1:3 -8 28 - 32- | | |
|---|-----------------------------------|-------------------------------------|--|--|--|---|
| NON-LINEAR | R LEAST | SQUARES | S SUMMARY | STATISTICS | DEPENDENT ' | VARIABLE TCA |
| SOURCE REGRESS RESIDUA UNCORRI | SION AL ECTED 1 | POTAL | DF SUM (2 294 4 (6 300 | DF SQUARES 4.11789514 5.76017854 D.87807368 | MEAN SQUARE 147.05894757 1.69004464 | |
| (CORREC | CTED TO | TAL) | 5 54 | 4.90298664 | | |
| PARAMET | TER | ESTIMA | TE ASYI STD | MPTOTIC ERROR | ASYMPTOT: CONFIDENCE LOWER | IC 95 % INTERVAL UPPER |
| A B | | | | | 6807519032 0.420 2609346350 0.242 | 013547019 |
| LOT | ХГ | XU | AUC | UCP | DIF | PCT |
| 3 4 | 38 86 134 | 38 86 134 184 | 0.1643 0.1524 0.0974 0.1441 | 0.153903 0.147936 0.144266 0.142005 | 0.068361 0.010397 0.004464 -0.046866 0.002095 0.011836 | 6.328 2.929 -48.118 1.454 |
| | | | SY | S=CP-1035N- | | |
| | | | | | DEPENDENT ' | |
| SOURCE REGRESS RESIDUA UNCORRE | SION AL ECTED 1 | OTAL | DF SUM (2 208 4 : 6 209 | DF SQUARES 3.02749775 1.22065445 9.24815220 | MEAN SQUARE 104.01374888 0.30516361 | |
| (CORREC | CTED TO | TAL) | 5 4: | 1.36682739 | | |
| PARAMET | TER | ESTIMA | | MPTOTIC ERROR | ASYMPTOT CONFIDENCE LOWER | |
| A B | | | | | 2642486869 0.199 4217541741 0.16 | |
| LOT | ХL | υχ | AUC | UCP | DIF | PCT |
| 1 2 3 4 5 | 0 12 38 86 134 184 | 12 38 86 134 184 264 | 0.1248 0.0903 0.1236 0.1287 0.1310 0.1154 | 0.115289 0.117837 0.119274 0.120195 0.120779 0.121318 | 0.009511 -0.027537 0.004326 0.008505 0.010221 -0.005918 | 7.621 -30.495 3.500 6.608 7.802 -5.128 |

| | | | QV | ==TTT | | |
|---------------------------------|--|--|--|---|---|--|
| NON-LINEA | | | | | DEPENDENT | |
| | SION VAL VECTED 1 | | 2 15° 3 5 15° | | MEAN SQUARE 785.2737392 0.1648533 | |
| (CORRE | CTED TO | TAL) | 4 | 40.2575028 | | |
| PARAME | TER | | STD | | | UPPER |
| A B | | | | | 939009890 0.79 55774730117 | |
| LOT | ХĽ | ΧU | AUC | UCP | DIF | PCT |
| 2 3 4 | 45 121 | 121 198 270 | 0.2764 0.2466 0.2308 | 0.283703 0.246404 0.227427 | 0.0057755 -0.0073026 0.0001960 0.0033728 0.0042899 | -2.6420 0.0795 1.4614 |
| | | | SYS | =LANNAV | | |
| NON-LINEA | R LEAST | SQUARE | es summary | STATISTICS | DEPENDENT | VARIABLE TCA |
| | SION AL ECTED T | OTAL | 2 873 5 7 873 | 339.063553 0.167343 339.230896 | MEAN SQUARE 43669.531777 0.033469 | |
| (CORRE | CTED TO | YTAL) | 6 173 | 386.822804 | | |
| PARAME A | 1. | | STD. 570 0.00782 | | | INTERVAL UPPER 480016125 |
| В | -0. | 1154519 | 360 0.00076 | 5222757 -0.13 | 174113003 -0.1 | 134926204 |
| LOT | XL | XU | AUC | UCP | DIF | PCT |
| 1 2 3 4 5 6 7 | 0 4 38 176 320 464 608 | 4 38 176 320 464 608 724 | 1.7500 1.3199 1.0761 0.9679 0.9184 0.8854 0.8643 | 1.76085 1.31040 1.07693 0.96898 0.91806 0.88518 0.86307 | -0.010846 0.009498 -0.000834 -0.001081 0.000343 0.000216 0.001228 | -0.61976 0.71959 -0.07748 -0.11173 0.03731 0.02438 0.14207 |

| | | | | | 5YS: | =LANTAR | P | | | | |
|--------|--------------------|-------------|----------|------|---------|------------------|---------------|--------|---------|------------------------|----------|
| NON-L | NEAR | LEAST | SQUARES | SUI | 1MARY | STATIS | TICS | DEP1 | ENDENT | VARIABLE | TCA |
| SOU | JRCE | | | DF | SUM (| OF SQUA | RES | MEAN | SQUARE | E | |
| REX | RESSI | ON | | 2 | 648 | 303.725 | 383 | | .862691 | | |
| RES | SIDUAL | | | - 5 | | 0.155 | 392 | | .031078 | | |
| UNC | CORREC | TED TO | TAL | 7 | 648 | 303.880 | 775 | _ | | | |
| (00 | (CORRECTED TOTAL) | | | | | 795.420 | 992 | | | | |
| PAF | PARAMETER ESTIMATE | | | | | APTOTIC ERROR | | | | TIC 95 % E INTERVAL | |
| _ | | | -000000 | | 0054 | | | | OR 1 | UPPER | |
| A | | | | | | | | | | 473093768 | |
| В | | -0.1 | LU7486U4 | U U. | . 00086 | 312970 | -0.10 | 970475 | 34 -0.1 | 1052673266 | 5 |
| LC | T | XT | ΧU | ΑU | JC | ua | 9 | DIE | 7 | PCT | |
| 1 | L | 0 | 4 | 1.4 | 1375 | 1.47 | 523 | ~0.033 | 7732 | -2.6248 | |
| 2 | | 4 | 38 | | .286 | 1.120 | | 0.007 | | 0.6860 | |
| 3 | 3 | | | | 375 | | 803 | -0.000 | 0532 | -0.0567 | |
| 4 | | 166 | | | 3490 | 0.850 | | -0.001 | 1261 | -0.1485 | |
| 5 | | | | | 081 | 0.000 | 716 | 0.001 | 1935 | 0.1157 | |
| ě | | 454 | | | 7795 | | 962 | | | -0.0154 | |
| | | 598 | | | 7619 | | | | | 0.0966 | |
| • | • | 3 50 | 7.4 | 0. | 012 | 0.70. | 110 | 0.000 | 7730 | 0.0300 | |
| | | | | | SYS= | LANTRE | J | | | | |
| NON-LI | NEAR | LEAST | SQUARES | SUM | MARY | STATIST | rics | DEPE | INDENT | VARIABLE | TCA |
| SOU | RŒ | | | DF | SUM C | F SQUAR | 2.45 | MEAN | SQUARE | | |
| | RESSI | ON | | | | 37.333 | | | 666993 | | |
| | | | | 3 | | 1.0624 | 480 | 0. | 354160 | | |
| UNC | ORREC | TED TO | TAL | 5 | 119 | 38.3964 | 467 | • | | | |
| - | | | | | | | | | | | |
| (CC | RRECT | ED TOI | YAL) | 4 | 14 | 183.5306 | 558 | | | | |
| PAR | AMETE | R | ESTIMAT | E | ASYM | PTOTIC | | AS | YMPTOT | 'IC 95 % | |
| | | | | | STD. | ERROR | | CONF | IDENCE | INTERVAL | |
| | | | | | | | | LOWE | ĪR. | UPPER | ? |
| A | | 0.69 | 5406248 | 4 0. | 02324 | 498901 | 0.621 | | | 938342594 | |
| В | | | | | | | | | | 327427399 | |
| _ | | | | | | | | | | | |
| LOT | , | ХL | ΧU | AUC | • | UCP | | | DIF | PCI | • |
| | | | | | | | | _ | | | |
| 1 | | 0 | | 0.43 | | 0.4351 | | 0.003 | | 0.7187 | |
| 2 | | | | 0.33 | | 0.3362 | | -0.000 | | -0.2769 | |
| 3 | | | | 0.29 | | 0.3003 | | -0.002 | | -0.9711 | |
| 4 | | | | 0.28 | | 0.2826 | | 0.003 | | 1.3606 | |
| 5 | 6 | 55 | 720 | 0.26 | 93 | 0.2741 | L88 | -0.004 | 18880 | -1.8151 | |
| | | | | | | | | | | | |

| | | | SY | S=HH-52 | | |
|--|---|---|---|--|--|--|
| N-LINEAR | LEAST | SQUARE: | s summary | STATISTICS | DEPENDI | ENT VARIABLE TO |
| SOURCE | | | DF SUM (| OF SQUARES | MEAN SQI | JARE |
| REGRESSI | ON | | 2 310 | 07.9156123 | 1553.957 | 3061 |
| RESIDUAL | | | 4 | 3.0464127 | 0.761 | 5032 |
| UNCORREC | TED TO | TAL | 6 31: | 3.0464127 10.9620250 | | |
| (CORRECT | ED TOT | 'AL) | 5 7: | 31.1991835 | | |
| PARAMETE | IR | ESTIMA: | TE ASYI | PTOTIC | ASYM | PTOTIC 95 % ENCE INTERVAL |
| | | | STD | . ERROR | CONFID | ENCE INTERVAL |
| | | | | | LOWER | UPPER |
| A | 2.4 | 933672 | 72 0.11979 | 9054150 2.1 | .607799099 | 2.8259546347 |
| В | -0.2 | 094252 | 52 0.01619 | 9817133 -0.2 | 2543979870 | -0.1644525370 |
| LOT | ХГ | ΧU | AUC | UCP | DIF | PCT |
| 1 | 0 | 28 | 1.577 | 1.56954 | 0.007462 | 0.4732 |
| 2 | 28 | | 1.104 | 1 18293 | -0 078933 | -7.1497 |
| 3 | 42 | <i>C</i> 0 | 1 085 | 1 09744 | <u>-</u> ∩ ∩∩я⊿з9 | -n 7778 |
| 4 | 60 | | 1.012 | 1.03255 0.99358 | -0.020550 | -2.0306 |
| | 00 | 75 | 1.012 | 0.00250 | 0.020330 | 2.0500 |
| 5 | 75 | X.1 | 1 1141 | | | 4 5554 |
| 5 6 | 75 87 | 87 99 | 1.041 1.055 | 0.99358 | 0.047422 | 4.5554 8.5128 |
| | 87 | 99 | 1.055 | 0.99358 0.96519 S=CH-46 | 0.089810 | 8.5128 |
| 6 | 87 | 99 | 1.055 sys | 0.96519 S=CH-46 | 0.089810 | 8.5128 |
| 6 N-LINEAR | 87 | 99 SQUARE: | 1.055 sy: s summary | 0.96519 S=CH-46 STATISTICS | 0.089810 | 8.5128 |
| 6 N-LINEAR SOURCE | 87 LEAST | 99 SQUARE | 1.055 SYS S SUMMARY DF SUM (| 0.96519 S=CH-46 STATISTICS OF SQUARES | 0.089810 DEPENDI | 8.5128 ENT VARIABLE TO |
| 6 N-LINEAR SOURCE REGRESSI | 87 LEAST | 99 SQUARE | 1.055SYS S SUMMARY DF SUM (2 35 | 0.96519 S=CH-46 STATISTICS DF SQUARES 3636.25318 | 0.089810 DEPENDI MEAN SQI 176818.1 | 8.5128 ENT VARIABLE TO JARE 2659 |
| 6 N-LINEAR SOURCE | 87 LEAST | 99 SQUARE: | 1.055SYS S SUMMARY DF SUM (2 35: 6 ! | 0.96519 S=CH-46 STATISTICS OF SQUARES | 0.089810 DEPENDI MEAN SQI 176818.1 | 8.5128 ENT VARIABLE TO JARE 2659 |
| 6 N-LINEAR SOURCE REGRESSI RESIDUAL | 87 LEAST ON TED TO | 99 SQUARE: TAL | 1.055SYS S SUMMARY DF SUM (2 35) 6 5 | 0.96519 S=CH-46 STATISTICS OF SQUARES 3636.25318 5976.76599 | 0.089810 DEPENDI MEAN SQI 176818.1 | 8.5128 ENT VARIABLE TO JARE 2659 |
| 6 N-LINEAR SOURCE REGRESSI RESIDUAL UNCORRECT | 87 LEAST ON TED TO | 99 SQUARE: TAL | 1.055SYS S SUMMARY DF SUM (2 35: 6 ! 8 35: 7 5 | 0.96519 S=CH-46 STATISTICS OF SQUARES 3636.25318 5976.76599 9613.01916 | 0.089810 DEPENDI MEAN SQI 176818.1: 996.1: | 8.5128 ENT VARIABLE TO JARE 2659 2766 |
| 6 N-LINEAR SOURCE REGRESSI RESIDUAL UNCORREC | 87 LEAST ON TED TO | 99 SQUARE: TAL | 1.055SYS S SUMMARY DF SUM (2 355 6 5 8 355 7 5 | 0.96519 S=CH-46 STATISTICS OF SQUARES 3636.25318 5976.76599 9613.01916 | 0.089810 DEPENDI MEAN SQI 176818.13 996.13 | 8.5128 ENT VARIABLE TO JARE 2659 2766 PTOTIC 95 % ENCE INTERVAL |
| 6 N-LINEAR SOURCE REGRESSI RESIDUAL UNCORRECT (CORRECT | 87 LEAST ON TED TO | 99 SQUARE: TAL TAL ESTIMA: | 1.055SYS S SUMMARY DF SUM (2 35: 6 ! 8 35: 7 5' TE ASYI | 0.96519 S=CH-46 STATISTICS OF SQUARES 3636.25318 5976.76599 9613.01916 7764.44745 MPTOTIC . ERROR | 0.089810 DEPENDI MEAN SQI 176818.13 996.13 ASYMI CONFIDI LOWER | 8.5128 ENT VARIABLE TO JARE 2659 2766 PTOTIC 95 % ENCE INTERVAL UPPER |
| 6 N-LINEAR SOURCE REGRESSI RESIDUAL UNCORRECT | 87 LEAST ON TED TO | 99 SQUARE: TAL | 1.055SYS S SUMMARY DF SUM (2 35: 6 5: 8 35: 7 5' TE ASYN STD | 0.96519 S=CH-46 STATISTICS OF SQUARES 3636.25318 5976.76599 9613.01916 7764.44745 MPTOTIC . ERROR | 0.089810 DEPENDI MEAN SQI 176818.13 996.13 ASYMI CONFIDI LOWER 1968981360 | 8.5128 ENT VARIABLE TO JARE 2659 2766 PTOTIC 95 % ENCE INTERVAL |
| 6 N-LINEAR SOURCE REGRESSI RESIDUAL UNCORRECT (CORRECT PARAMETE | 87 LEAST ON TED TO | 99 SQUARE: TAL TAL) ESTIMAT | 1.055SYS S SUMMARY DF SUM (2 35: 6 5: 8 35: 7 5' TE ASYN STD | 0.96519 S=CH-46 STATISTICS OF SQUARES 3636.25318 5976.76599 9613.01916 7764.44745 MPTOTIC . ERROR | 0.089810 DEPENDI MEAN SQI 176818.13 996.13 ASYMI CONFIDI LOWER 1968981360 | 8.5128 ENT VARIABLE TO JARE 2659 2766 PTOTIC 95 % ENCE INTERVAL UPPER 14.329496569 |
| 6 N-LINEAR SOURCE REGRESSI RESIDUAL UNCORRECT CORRECT PARAMETE A B LOT | 87 LEAST CON TED TO | 99 SQUARE: TAL TAL 131973: 291466: XU | 1.055 SYS S SUMMARY DF SUM (2 35: 6 9 8 35: 7 5' TE ASYN STD 52 2.622: 50 0.0606 AUC | 0.96519 S=CH-46 STATISTICS DF SQUARES 3636.25318 5976.76599 9613.01916 7764.44745 MPTOTIC . ERROR 2009519 1.4 8097538 -0.3 | 0.089810 DEPENDI MEAN SQI 176818.1: 996.1: ASYMI CONFIDI LOWER 1968981360 3779428649 DIF | 8.5128 ENT VARIABLE TO JARE 2659 2766 PTOTIC 95 % ENCE INTERVAL UPPER 14.329496569 -0.080350436 |
| 6 N-LINEAR SOURCE RECRESSI RESIDUAL UNCORRECT CORRECT PARAMETE A B LOT 1 | 87 LEAST CON TED TOT TR 7.9 -0.2 XL 0 | 99 SQUARE: TAL TAL 131973: 2291466: XU 14 | 1.055SYS S SUMMARY DF SUM (2 35: 6 9 8 35: 7 5: TE ASYN STD: 52 2.622: 50 0.0608 AUC 7.541 | 0.96519 S=CH-46 STATISTICS DF SQUARES 3636.25318 5976.76599 9613.01916 7764.44745 MPTOTIC . ERROR 2009519 1.4 8097538 -0.3 UCP 5.60723 | 0.089810 DEPENDI MEAN SQI 176818.1: 996.1: ASYMI CONFIDI LOWER 1968981360 3779428649 DIF 1.93377 | 8.5128 ENT VARIABLE TO JARE 2659 2766 PTOTIC 95 % ENCE INTERVAL |
| 6 N-LINEAR SOURCE RECRESSI RESIDUAL UNCORRECT CORRECT PARAMETE A B LOT 1 | EAST CON TED TOT TR 7.9 -0.2 XL 0 14 | 99 SQUARE: TAL TAL 131973: 291466: XU 14 50 | 1.055SYS S SUMMARY DF SUM (2 35) 6 5 8 359 7 57 TE ASYN STD 52 2.6222 50 0.0608 AUC 7.541 3.898 | 0.96519 S=CH-46 STATISTICS OF SQUARES 3636.25318 5976.76599 9613.01916 7764.44745 MPTOTIC . ERROR 2009519 1.4 8097538 -0.3 UCP 5.60723 3.63688 | 0.089810 DEPENDI MEAN SQI 176818.1: 996.1: ASYMI CONFIDI LOWER 1968981360 3779428649 DIF 1.93377 0.26112 | 8.5128 ENT VARIABLE TO JARE 2659 2766 PTOTIC 95 % ENCE INTERVAL UPPER 14.329496569 -0.080350436 PCT 25.6434 6.6988 |
| 6 N-LINEAR SOURCE REGRESSI RESIDUAL UNCORRECT CORRECT PARAMETE A B LOT | 87 LEAST CON TED TOT TR 7.9 -0.2 XL 0 | 99 SQUARE: TAL TAL 131973: 2291466: XU 14 | 1.055SYS S SUMMARY DF SUM (2 35: 6 9 8 35: 7 5: TE ASYN STD: 52 2.622: 50 0.0608 AUC 7.541 | 0.96519 S=CH-46 STATISTICS DF SQUARES 3636.25318 5976.76599 9613.01916 7764.44745 MPTOTIC . ERROR 2009519 1.4 8097538 -0.3 UCP 5.60723 | 0.089810 DEPENDI MEAN SQI 176818.1: 996.1: ASYMI CONFIDI LOWER 1968981360 3779428649 DIF 1.93377 | 8.5128 ENT VARIABLE TO JARE 2659 2766 PTOTIC 95 % ENCE INTERVAL UPPER 14.329496569 -0.080350436 PCT 25.6434 |

| | | | 486 | | | | | 62 | | | | 12.2261 | |
|-----|----------------------|------------|------------|--------|------------|--------------|------------|----------|--------|----------------|------|---------------------------------|-----|
| | 7 | 486 576 | 576 624 | 2.3 | 370 347 | 1. | 879 927 | 54 18 | 0. | 49046 71982 | | 20.6943 28.2616 | |
| | 0 | 370 | | | | | | | | | | | |
| | | | | | si | (S=H- | 53- | | | | | | |
| NO | N-LINEAR | LEAST | SQUARES | SUMP | IARY | STAT | 'IST | ICS | ב | EPEND | ENT | VARIABLE ' | TCA |
| | SOURCE | | | DF S | UM C | OF SQ | UAR | ES | ME | an so | UARE | } | |
| | REGRESSI | ON | | 2 | 618 | 3899. | 616 | 80 | 309 | 1449.8 | 0840 | , | |
| | RESIDUAL UNCORREC | , , | ma r | ь 0 | C10 | 179. | 148 | 46 | | 29.8 | 5808 | i | |
| | UNCORREC | STED TO | TAL | 8 | 977 | 9U/U. | /65 | 26 | | | | | |
| | (CORRECT | TED TOT | AL) | 7 | 355 | 5155. | 118 | 28 | | | | | |
| | PARAMETE | OR. | ESTIMATI | Ξ | ASYN | PTOT | 'IC | | | ASYM | PTOI | 'IC 95 % | |
| | | | | | | | | | I | OWER | | 'IC 95 % : INTERVAL UPPER | |
| | A | | | | | | | | | | | 428916719 | |
| | В | -0.1 | 13354723 | 3 0.0 | 1005 | 50778 | 58 | -0.: | 137948 | 31105 | -0.0 | 887613365 | |
| | LOT | XL | XU | ĄŲ | JC | | UŒP | | | DIF | • | PCT | |
| | 1 | 0 | 10 | 6.7 | 52 | 5. | 945 | 43 | 0. | 80657 | | 11.946 | |
| | 2 | 10 | 141 | 4.2 | 64 | 4. | 287 | 06 | ~0. | 02306 | | -0.541 | |
| | 3 | 141 | 281 | 3.7 | 62 | 3. | 739 | | 0. | 02208 | | 0.587 | |
| | 4 | 281 | 293 | 3.3 | 82 | 3. | | 13 | -0. | 22113 | | -6.538 | |
| | 5 | 293 | 323 | 3.3 | 341 | 3. | | 55 | ∩ | 22355 | | -K 990 | |
| | ပ် | 323 | 331 | 3.1 | .54 | 3. | | 21 | -0. | 39621 15732 | | -12.562 | |
| | 7 | 331 | 361 367 | 3.6 | 85 147 | 3. | | 68 | 0. | 15732 | | 4.269 | |
| | 8 | 361 | 367 | 3.5 | 14/ | 3. | 507 | 32 | υ. | 43968 | | 11.139 | |
| | | | | | 51 | (S=CH | -47 | | | | | | |
| | | | | | | | | | | | | | |
| NOI | N-LINEAR | LEAST | SQUARES | SUMM | IARY | STAT | 'IST | ICS | D | EPEND | ENT | VARIABLE | ICA |
| | SOURCE | | | DF S | UM (| OF SO | UAR | ES | ME | AN SO | UARE | } | |
| | REGRESSI | ON | | | | | | | | | | | |
| | RESIDUAL | | | 10 | | 1714. | | | | 171.4 | | | |
| | UNCORREC | TED TO | TAL | 12 | 485 | 5860. | 534 | 99 | | | | | |
| | (CORRECT | ED TOT | AL) | 11 | 132 | 2801. | 708 | 13 | | | | | |
| | PARAMETE | ©R | estimati | E | | 1PTOI ERR | | | C | | | IC 95 % INTERVAL UPPER | |
| | A | 7 5 | 41906538 | 3 2 | 4953 | 29722 | 05 | 1.0 | | | 13. | 101810191 | |
| | B | | | | | | | | | | | 052884312 | |

| LOT | $X\Gamma$ | ΧU | AUC | UCP | DIF | PCT |
|---|---|---|--|--|---|--|
| 7 | 0 | 18 | 6.181 | 5.42721 | 0.75379 | 12.195 |
| 1 | 0 | 42 | 5.226 | 4.05383 | 1.17217 | |
| 2 | 18 4 2 | 66 | 4.559 | 3.62184 | 0.93716 | 20.556 |
| 3 | | | 3.459 | 3.26339 | | |
| 4 | 66 | 126 | 2,760 | 2.95786 | -0.19786 | |
| 5 | 126 | 198 | | 2.68101 | -0.37401 | -16.212 |
| 6 | 198 | 358 | 2.307 | 2.50034 | -0.18734 | |
| 7 | 358 | 442 | 2.313 | 2.38855 | 0.30645 | 11.371 |
| 8 | 442 | 585 | 2.695 | | 1.14885 | |
| 9 | 585 | 630 | 3.463 | 2.31415 | | |
| 10 | 630 | 666 | 3.085 | 2.28673 | | 38.126 |
| 11 | | 678 | 3.671 | 2.27139 | 1.58801 | 41.226 |
| 12 | 678 | 690 | 3.852 | 2.26399 | 1.50001 | 41.220 |
| | | | S | YS=H-54 | - | |
| NON-LINEAR | LEAST | SQUARE | s summary | STATISTICS | DEPENDE | INT VARIABLE TCA |
| | | | | | | |
| SOURCE | | | DF SUM | F SQUARES | MEAN SQU | |
| REGRESS | | | 2 209 | 902.098236 | 10451.049 | |
| RESIDUA | | | | 226.690672 | 75.563 | 3557 |
| UNCORRE | CTED T | OTAL | 5 213 | 128.788908 | | |
| (CORREC | TED TO | TAL) | 4 3 | 891.650213 | | |
| | | | | | | |
| PARAMET | ER | ESTIMA | | MPTOTIC . | ASYME | PTOTIC 95 % |
| PARAMET | ER | ESTIMA | | MPTOTIC . ERROR | CONFIDE | INCE INTERVAL |
| • | | | STD | . ERROR | CONFIDE LOWER | INCE INTERVAL UPPER |
| A | 4. | 6413525 | STD 29 1.2888 | . ERROR 8428554 0.53 | CONFIDE LOWER 3961014147 | INCE INTERVAL UPPER 8.7430949164 |
| • | 4. | 6413525 | STD 29 1.2888 | . ERROR 8428554 0.53 | CONFIDE LOWER 3961014147 | INCE INTERVAL UPPER |
| A | 4. | 6413525 | STD 29 1.2888 | . ERROR 8428554 0.53 | CONFIDE LOWER 3961014147 | INCE INTERVAL UPPER 8.7430949164 |
| A B LOT | 4. -0. XL | 6413525 1075754 XU | STD 29 1.2888 61 0.0789 AUC | ERROR 3428554 0.53 050765035 UCP | CONFIDE LOWER 3961014147 5597202054 DIF | NCE INTERVAL UPPER 8.7430949164 0.1408210988 PCT |
| A B LOT | 4. -0. XL 0 | 6413525 1075754 XU 6 | STD 29 1.2886 61 0.0786 AUC 5.248 | ERROR 8428554 0.53 050765035 UCP 4.28907 | CONFIDE LOWER 3961014147 5597202054 DIF 0.95893 | UPPER 8.7430949164 0.1408210988 PCT 18.272 |
| A B LOT | 4. -0. XL 0 6 | 6413525 1075754 XU 6 30 | STD 29 1.2886 61 0.0786 AUC 5.248 3.388 | ERROR 8428554 0.53 050765035 UCP 4.28907 3.43674 | CONFIDE LOWER 3961014147 5597202054 DIF 0.95893 -0.04874 | PCT 18.272 -1.439 |
| A B LOT 1 2 3 | 4. -0. XL 0 6 30 | 6413525 1075754 XU 6 30 60 | STD 29 1.2886 61 0.0786 AUC 5.248 3.388 2.801 | ERROR 8428554 0.53 050765035 UCP 4.28907 3.43674 3.08883 | CONFIDE LOWER 3961014147 5597202054 DIF 0.95893 -0.04874 -0.28783 | PCT 18.272 -1.439 -10.276 |
| A B LOT 1 2 3 4 | 4. -0. XL 0 6 30 60 | 6413525 1075754 XU 6 30 60 83 | STD 29 1.2886 61 0.0786 AUC 5.248 3.388 2.801 3.402 | ERROR 8428554 0.53 050765035 UCP 4.28907 3.43674 3.08883 2.93354 | CONFIDE LOWER 3961014147 5597202054 DIF 0.95893 -0.04874 -0.28783 0.46846 | PCT 18.272 -1.439 -10.276 13.770 |
| A B LOT 1 2 3 4 | 4. -0. XL 0 6 30 60 | 6413525 1075754 XU 6 30 60 83 | STD 29 1.2886 61 0.0786 AUC 5.248 3.388 2.801 3.402 | ERROR 8428554 0.53 050765035 UCP 4.28907 3.43674 3.08883 | CONFIDE LOWER 3961014147 5597202054 DIF 0.95893 -0.04874 -0.28783 0.46846 | PCT 18.272 -1.439 -10.276 13.770 |
| A B LOT 1 2 3 4 5 | 4. -0. XL 0 6 30 60 83 | 6413525 1075754 XU 6 30 60 83 89 | STD 29 1.2888 61 0.0780 AUC 5.248 3.388 2.801 3.402 3.083 | ERROR 8428554 0.53 050765035 UCP 4.28907 3.43674 3.08883 2.93354 | CONFIDE LOWER 3961014147 5597202054 DIF 0.95893 -0.04874 -0.28783 0.46846 0.20858 | PCT 18.272 -1.439 -10.276 13.770 6.765 |
| A B LOT 1 2 3 4 5 | 4. -0. XL 0 6 30 60 83 | 6413525 1075754 XU 6 30 60 83 89 | STD 29 1.2888 61 0.0780 AUC 5.248 3.388 2.801 3.402 3.083 | ERROR 8428554 0.53 050765035 UCP 4.28907 3.43674 3.08883 2.93354 2.87442 | CONFIDE LOWER 3961014147 5597202054 DIF 0.95893 -0.04874 -0.28783 0.46846 0.20858 | PCT 18.272 -1.439 -10.276 13.770 6.765 |
| A B LOT 1 2 3 4 5 | 4. -0. XL 0 6 30 60 83 | 6413525 1075754 XU 6 30 60 83 89 | STD 29 1.2886 61 0.0786 AUC 5.248 3.388 2.801 3.402 3.083 | ERROR 8428554 0.53 050765035 UCP 4.28907 3.43674 3.08883 2.93354 2.87442 S=HH-60D | CONFIDE LOWER 3961014147 5597202054 DIF 0.95893 -0.04874 -0.28783 0.46846 0.20858 | PCT 18.272 -1.439 -10.276 13.770 6.765 |
| A B LOT 1 2 3 4 5 | 4. -0. XL 0 6 30 60 83 | 6413525 1075754 XU 6 30 60 83 89 | STD 29 1.2886 61 0.0786 AUC 5.248 3.388 2.801 3.402 3.083SY | ERROR 8428554 0.53 050765035 UCP 4.28907 3.43674 3.08883 2.93354 2.87442 S=HH-60D | CONFIDE LOWER 3961014147 5597202054 DIF 0.95893 -0.04874 -0.28783 0.46846 0.20858 | PCT 18.272 -1.439 -10.276 13.770 6.765 ENT VARIABLE TCA |
| A B LOT 1 2 3 4 5 | 4. -0. XL 0 6 30 60 83 | 6413525 1075754 XU 6 30 60 83 89 | STD 29 1.2886 61 0.0786 AUC 5.248 3.388 2.801 3.402 3.083SY | ERROR 8428554 0.53 050765035 UCP 4.28907 3.43674 3.08883 2.93354 2.87442 S=HH-60D STATISTICS | CONFIDE LOWER 3961014147 5597202054 DIF 0.95893 -0.04874 -0.28783 0.46846 0.20858 DEPENDE | PCT 18.272 -1.439 -10.276 13.770 6.765 ENT VARIABLE TCA UPPER 8.7430949164 0.1408210988 PCT 18.272 -1.439 -10.276 13.770 6.765 |
| A B LOT 1 2 3 4 5 NON-LINEAR SOURCE REGRESS | 4. -0. XL 0 6 30 60 83 | 6413525 1075754 XU 6 30 60 83 89 | STD 29 1.2888 61 0.0780 AUC 5.248 3.388 2.801 3.402 3.083 | ERROR 8428554 0.53 050765035 UCP 4.28907 3.43674 3.08883 2.93354 2.87442 S=HH-60D STATISTICS OF SQUARES 3876.79818 | CONFIDE LOWER 3961014147 5597202054 DIF 0.95893 -0.04874 -0.28783 0.46846 0.20858 DEPENDE MEAN SQU 61938.33 | PCT 18.272 -1.439 -10.276 13.770 6.765 ENT VARIABLE TCA UPPER 8.7430949164 0.1408210988 PCT 18.272 -1.439 -10.276 13.770 6.765 |
| A B LOT 1 2 3 4 5 NON-LINEAR SOURCE REGRESS RESIDUA | 4. -0. XL 0 6 30 60 83 | 6413525 1075754 XU 6 30 60 83 89 | STD 29 1.2888 61 0.0780 AUC 5.248 3.388 2.801 3.402 3.083 | ERROR 8428554 0.53 050765035 UCP 4.28907 3.43674 3.08883 2.93354 2.87442 S=HH-60D STATISTICS OF SQUARES 3876.79818 | CONFIDE LOWER 3961014147 5597202054 DIF 0.95893 -0.04874 -0.28783 0.46846 0.20858 DEPENDE MEAN SQU 61938.33 | PCT 18.272 -1.439 -10.276 13.770 6.765 ENT VARIABLE TCA JARE 9909 |
| A B LOT 1 2 3 4 5 NON-LINEAR SOURCE REGRESS RESIDUA | 4. -0. XL 0 6 30 60 83 | 6413525 1075754 XU 6 30 60 83 89 | STD 29 1.2888 61 0.0780 AUC 5.248 3.388 2.801 3.402 3.083 | ERROR 8428554 0.53 050765035 UCP 4.28907 3.43674 3.08883 2.93354 2.87442 S=HH-60D STATISTICS OF SQUARES 3876.79818 | CONFIDE LOWER 3961014147 5597202054 DIF 0.95893 -0.04874 -0.28783 0.46846 0.20858 DEPENDE MEAN SQU 61938.33 | PCT 18.272 -1.439 -10.276 13.770 6.765 ENT VARIABLE TCA JARE 9909 |

| P. | arameti | er | ESTIMAT | E | | | | AS CONF LOWE | IDENCE | |
|--------------|------------------------------------|----------|----------|------|-------|-----------|------|----------------------------|---------|--------------|
| А | | 8. | 08225119 | 2 0. | 3327 | 5452509 | 6. | 650508296 | | |
| В | | | | | | | | .096367077 | | |
| D | • | -0. | 04039300 | J 0. | OTTI | 13 / 0000 | -0. | .030301011 | 4 -0.00 | 004103327 |
| ; | LOT | XL | XU A | UC | τ | JŒP | | DIF | PCT | |
| | | 0 | 3 9. | 2 | 8.05 | 351 | 1. | 14649 | 12.4618 | 3 |
| | 2 | 3 | 28 7. | 1 | 7.12 | 2939 | -0. | .02939 | -0.4139 | 9 |
| | | | 63 6. | 7 | 6.72 | 2769 | -0. | .02939 .02769 .05012 | -0.413 | 3 |
| | | | 92 6. | Ŕ | 6.54 | 1988 | n. | 05012 | 0.7594 | 1 |
| | • | | J. U. | • | 0.5 | .500 | ٠. | .03012 | 0.755 | • |
| | | | | | 5 | SYS=SH- | 3 | | | |
| NON- | LINEAR | LEAST | SQUARES | SUM | MARY | STATIS' | rics | S DEPE | NDENT V | VARIABLE TCA |
| S | OURCE | | | DF | SUM (| F SQUA | RES | MEAN | SQUARE | |
| | EGRESS: | ION | | 2 | 725 | 573.708 | 002 | 36286. | 854001 | |
| | ESIDUA | | | 7 | | 102 605 | 540 | 57 | 515077 | |
| | | | OTAL | ģ | 729 | 76.313 | 542 | 36286. 57. | 010077 | |
| (| CORRECT | red to | TAL) | | | | | | | |
| P. | ARAMETT | ⊒R | ESTIMAT | E | ASYN | PTOTIC | | AS | YMPTOT' | C 95 % |
| | | | | | | ERROR | | | | INTERVAL |
| | | | | | | | | | R | |
| A | | 4. | 69121333 | 6 0. | 62747 | 7560389 | 3. | 207457394 | 0 6.17 | 749692774 |
| В | | | | | | | | 234234937 | | |
| | | | | | | | | | | |
| | LOT | XL | XU | A | UC. | va | 5 | DIF | | PCT |
| | 1 | 0 | 20 | 3 | 327 | 3 41 | 726 | -0.090 | 26 | -2 713 |
| | 2 | | 69 | | | 2.52 | | -0.040 | | |
| | 2 | | | | | | | | | |
| | 3 | | 140 | | | | | 0.148 | | |
| | 4 | | 185 | | | | | -0.199 | | |
| | 5 | | 221 | | | 1.93 | | -0.066 | 25 | -3.543 |
| | 6 | 221 | 257 | | 589 | 1.88 | | -0.295 | | -18.575 |
| | 7 | 257 | 287 | 1. | 703 | | | | | -8.270 |
| | 8 | 287 | 335 | 1. | 930 | 1.80 | 330 | 0.126 | 70 | 6.565 |
| | 9 | | 350 | | 144 | 1.77 | 423 | 0.369 | 77 | 17.247 |
| <u>c.9.5</u> | C.9.5 - Tactical Armament Programs | | | | | | | | | |
| | | | | | SYS | S≈LLLGB | | | | |
| NON- | LINEAR | LEAST | SQUARES | SUM | MARY | STATIS | rics | S DEPE | NDENT V | VARIABLE TCA |
| Q | OURCE | | | ישת | SIM | OF SQUA | 275 | MEAN | SOUARE | |
| | EGRESS: | TON | | 2 | | 0658.75 | | | | |
| | | | | 8 | 220 | 7.66 | | | .95792 | |
| R | ESIDUA | L | | 0 | | 7.00 | 220 | U | .33/34 | |

UNCORRECTED TOTAL 10 220666.41749 9 31936.24632 (CORRECTED TOTAL) ESTIMATE ASYMPTOTIC ASYMPTOTIC 95 % PARAMETER STD. ERROR CONFIDENCE INTERVAL LOWER 0.0812265050 0.00211969466 0.07633843320 0.08611457683 Α -.1706336345 0.00246086390 -.17630845162 -.16495881745 UCP DIF PCT XL XU AUC LOT 1600 0.0275 0 0.0278113 -0.00031126 -1.1319 1600 4550 0.0206 0.0208049 -0.00020489 -0.9946 2 8290 0.0189 0.0182502 0.00064985 3.4383 3 4550 0.0162498 4 8290 17270 0.0162 -0.00004977 -0.307217270 26890 0.0147 0.0147626 -0.00006259 -0.425826890 41290 0.0137 0.0137067 -0.00000673 -0.04916 41290 56890 0.0129 0.2220 7 0.0128714 0.00002863 0.0122749 0.00002509 0.0123 8 56890 72490 0.2040 72490 88090 0.0118 0.0118286 -0.00002863 -0.2426 9 10 88090 100000 0.0115 0.0115116 -0.00001165 -----SYS=CEM-------NON-LINEAR LEAST SQUARES SUMMARY STATISTICS DEPENDENT VARIABLE TCA SOURCE DF SUM OF SQUARES MEAN SQUARE 2 1106261.2968 553130.6484 REGRESSION 141.9837 RESIDUAL 6 851.9021 UNCORRECTED TOTAL 8 1107113.1989 (CORRECTED TOTAL) 7 367517.1256 ASYMPTOTIC ASYMPTOTIC 95 % PARAMETER ESTIMATE STD. ERROR CONFIDENCE INTERVAL LOWER 0.0970924048 0.01588017393 0.05823499093 0.13594981861 Α -.1753319483 0.01461763837 -.21110004666 -.13956384992 LOT ХL XU AUC UCP DIF PCT 0 172 0.06924 0.0477470 0.0214930 31.041 1 172 1432 0.03038 0.0309053 -0.0005253 -1.7293 7557 0.01988 0.0226510 -0.0027710 -13.938 1432 7557 21777 0.01765 0.0182182 -0.0005682 -3.2195 21777 50227 0.01619 0.0155158 0.0006742 4.164 1.197 50227 85247 0.01401 0.0138422 0.0001678 7 852**47** 0.01258 134157 0.0127124 -0.0001324 -1.053

134157 171666 0.01181 0.0119788 -0.0001688

-1.429

| | | | | SV | 5= <i>C</i> 1011_1 | | | | |
|---|--|---|------------|---|--|---|------------------------------|--|--|
| NON-LI | NEAR LEAS | | | | | | | | VARIABLE TCA |
| REG RES | RCE RESSION IDUAL CORRECTED | | 2 7 | 398 : | OF SQUAR 833.966 246.3195 080.2862 | 595 542 | MEAN SQ 19916.98 35.18 | 3348 | |
| (cc | RRECTED 1 | TOTAL) | 8 | 10: | 225.3996 | 532 | | | |
| PAR | AMETER | ESTIMATE | ; | | MPTOTIC ERROR | | ASY CONFII LOWER | | |
| A B | | .1696624466 .0149690405 | | | | | 470339937 | | 462149375 |
| LOT | , XT | χU | A | UC | UC | P | | DIF | PCT |
| 1 2 3 4 5 6 7 8 9 | 0 40 105 445 695 1015 1615 2215 2815 | 40 105 445 695 1015 1615 2215 2815 3415 | 0.0.0.0.0. | 1975 2000 1439 1483 1308 1718 1539 1483 1420 (rams | 0.15 0.15 0.15 0.15 0.15 0.15 | 52988 59211 56153 54307 53368 52390 51524 50903 50419 | 0.002 | 0789 2253 5007 2568 9410 2376 2603 | 17.475 20.394 -8.515 -4.051 -17.254 11.298 1.544 -1.755 -5.929 |
| | | | | SY | S=AMRAAN | 1 | | | |
| NON-LI | NEAR LEAS | ST SQUARES | SUM | MARY | STATIST | rics | DEPEN | DENT ' | VARIABLE TCA |
| RES UNC | RCE RESSION IDUAL CORRECTED | TOTAL | 2 8 | 320 320 | OF SQUAR 65080.10 1764.75 66844.86 | 098 593 590 | MEAN S(1632540 220 | | |
| PAR | AMETER | ESTIMATE | ; | | MPTOTIC ERROR | | | | IC 95 % INTERVAL |

Α

4.629798003 0.27246839272 4.0014787005 5.2581173046 -0.340271226 0.00672409173 -0.3557771594 -0.3247652935

LOWER

| LOT | XL | υx | AUC | UCP | DIF | PCT |
|---|--|---|---|--|--|--|
| 1 2 3 4 5 6 7 8 9 10 | 0 194 1251 3215 6211 9111 12011 14911 17911 20911 | 3215 6211 9111 12011 14911 17911 20911 24674 | 0.512 0.342 0.257 0.232 0.194 0.182 0.170 0.158 0.155 | 0.22133 0.19817 0.18236 0.17043 0.16094 0.15239 | 0.0642458 -0.0071091 0.0008837 -0.0054854 0.0106654 -0.0041698 -0.0003646 -0.0004313 -0.0029386 0.0026101 | 5.2105 -1.3885 0.2584 -2.1344 4.5972 -2.1494 -0.2003 -0.2537 -1.8599 1.6839 |
| NON-LINEAR | R LEAST | SQUARES | SUMMARY | STATISTICS | DEPENDEN | T VARIABLE TCA |
| | SION ECTED TO | OTAL FAL) | 2 158 9 11 158 | DF SQUARES 33952.5788 2088.1396 36040.7184 | | 94 |
| PARAMET | | ESTIMATE | | PTOTIC | ASYMPT | OTTC 95 % |
| | | 20111111 | | ERROR | | CE INTERVAL UPPER |
| A B | | | | | 4472055564 1 4326940685 -0 | .6989908071 |
| LOT | XL | VU | AUC | UŒP | DIF | PCT |
| 9 10 11 | 3144 5612 7731 9863 12863 15863 | | 0.184 0.177 0.196 | 0.195032 0.184811 0.175857 0.170911 | 0.001168 0.001968 -0.000811 0.001143 0.025089 | 10.7477 2.4951 -4.8194 -1.6042 0.5614 0.9992 -0.4406 0.6459 |
| | | | | | | T VARIABLE TCA |
| SOURCE REGRESS | SION | | DF SUM 0 | OF SQUARES 25173.0565 6291.0488 21464.1053 | MEAN SQUAR | RE 82 |

| | (CORRECTED TOTAL) | | 8 458719.8690 | | | | |
|-----|-------------------|--|---|--|--|--|--|
| | PARAMET | 'EER | ESTIMATE | | PTOTIC ERROR | ASYMPTOTIC CONFIDENCE LOWER | C 95 % INTERVAL UPPER |
| | A | 0.3 | 563409020 | 0.09506 | 244145 0.13 | 3155214296 0.581 | |
| | В | 1 | 781343592 | 0.02647 | 20658324 | 1073135061115 | 53736785 |
| | | | | | | | |
| | LOT | XL | XU | AUC | UCP | DIF | PCT |
| | | _ | | | | | |
| | 1 | 0 | 200 | 0.309 | 0.168722 | | .3973 |
| | 2 | 200 | 1100 | 0.135 | 0.114715 | | .0263 |
| | 3 | 1100 | 3700 | 0.083 | 0.090095 | | .5478 |
| | 4 | 3700 | 9429 | 0.082 | 0.074987 | | .5528 |
| | 5 | 9429 | 18429 | 0.062 | 0.065363 | | .4247 |
| | | 18429 | 30429 | 0.057 | 0.059042 | | .5832 |
| | | 30429 | 42429 | 0.055 | 0.054920 | 0.000080 0 | .1453 |
| | | 42429 | 54429 | | 0.052182 | 0.000818 1 | .5432 |
| | 9 | 54429 | 60664 | 0.057 | 0.050581 | 0.006419 11 | .2614 |
| | | | | ava | =AIM7F-R | | |
| | | | | 515 | -WIW/E-K | | |
| NO | N-I.TNEAR | LEAST | SOUARES S | SUMMARY | STATISTICS | DEPENDENT V | ARIABLE TCA |
| 110 | | | | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | | |
| | SOURCE | | C | OF SUM O | F SQUARES | MEAN SQUARE | |
| | RECRESS | ION | | 2 114 | 765.36199 | 57382.68099 | |
| | RESIDUA | | | | 386.22291 | 64.37049 | |
| | | | OTAL | 8 115 | 151.58490 | | |
| | | | | | | | |
| | (CORREC | TED TO | TAL) | 7 6 | 543.29279 | | |
| | | | | | | | ~ 05 0 |
| | PARAMET | ER | ESTIMATE | | PTOTIC | ASYMPTOTI | C 95 % |
| | | | | SID. | ERROR | CONFIDENCE | |
| | _ | _ | | | | LOWER | UPPER |
| | A | | | | | 237503812 3.29 | |
| | В | -0. | 375843314 | 0.01864 | 235156 -0.4 | 214595381 -0.33 | 02270904 |
| | | | | | | | |
| | T.OT | YT. | ווצ | ALC | UCP | DIF | PCT |
| | LOT | ХГ | XU | AUC | UCP | DIF | PCT |
| | | | | | | | |
| | | 0 | 100 | 0.741 | 0.698208 | 0.042792 | 5.775 |
| | 1 2 | 0 100 | 100 325 | 0.741 0.378 | 0.698208 0.337272 | 0.042792 0.040728 | 5.775 10.774 |
| | 1 2 | 0 100 325 | 100 325 925 | 0.741 0.378 0.199 | 0.698208 0.337272 0.223662 | 0.042792 0.040728 -0.024662 | 5.775 10.774 -12.393 |
| | 1 2 3 4 | 0 100 325 925 | 100 325 925 1725 | 0.741 0.378 0.199 0.169 | 0.698208 0.337272 0.223662 0.166353 | 0.042792 0.040728 -0.024662 0.002647 | 5.775 10.774 -12.393 1.566 |
| | 1 2 3 4 | 0 100 325 925 1725 | 100 325 925 1725 2825 | 0.741 0.378 0.199 0.169 0.134 | 0.698208 0.337272 0.223662 0.166353 0.135364 | 0.042792 0.040728 -0.024662 0.002647 -0.001364 | 5.775 10.774 -12.393 1.566 -1.018 |
| | 1 2 3 4 | 0 100 325 925 1725 2825 | 100 325 925 1725 2825 4225 | 0.741 0.378 0.199 0.169 0.134 0.116 | 0.698208 0.337272 0.223662 0.166353 0.135364 0.114627 | 0.042792 0.040728 -0.024662 0.002647 -0.001364 0.001373 | 5.775 10.774 -12.393 1.566 -1.018 1.184 |
| | 1 2 | 0 100 325 925 1725 | 100 325 925 1725 2825 | 0.741 0.378 0.199 0.169 0.134 | 0.698208 0.337272 0.223662 0.166353 0.135364 | 0.042792 0.040728 -0.024662 0.002647 -0.001364 0.001373 0.008186 | 5.775 10.774 -12.393 1.566 -1.018 |

-----SYS=AIM7F-GD------

| NON-LINEAR | LEAST S | QUARES S | UMMARY ST | PATISTICS | DEPENDENT V | ARIABLE TCA |
|---|-------------------------------------|--|--|--|---|--|
| SOURCE REGRESS RESIDUA UNCORRE | | | 4 87 | SQUARES 1.005468 7.152557 1.158025 | MEAN SQUARE 14267.002734 21.788139 | |
| (CORREC | TED TOTA | L) | 5 7732 | 2.207921 | | |
| PARAMET | Ter e | STIMATE | ASYMPT STD. S | | ASYMPTOTIC CONFIDENCE I LOWER | |
| A B | | | | | 41860256 3.216 13177613 -0.354 | |
| LOT | XL | υx | AUC | UCP | DIF | PCT |
| 1 2 3 4 5 | 0 15 85 295 505 1255 | 15 85 295 505 1255 2565 | 1.551 0.379 0.228 0.195 0.130 0.090 | 1.20734 0.44519 0.24644 0.17497 0.12692 0.09079 | 0.343661 -0.066187 -0.018444 0.020035 0.003081 -0.000790 | 22.157 -17.464 -8.090 10.274 2.370 -0.878 |

Bibliography

- 1. Air Force Systems Command. <u>The AFSC Cost Estimating Handbook Series: Volume 1 "AFSC Cost Estimating Handbook"</u>. Reading MA: The Analytic Sciences Corporation, undated.
- 2. Berg, Robert M. and others. <u>Evaluation of Models and Techniques</u> for Estimating the Effects of Competition, Alexandria VA: Center for Naval Analyses, January 1986 (AD-A173660).
- 3. Bolton, Capt Hugh K. Evaluation of the Air Force Systems Command Production Rate Model and Alternate Formulations. MS thesis, AFIT/GSM/LSQ/85S-3. School of Systems and Logistics, Air Force Institute of Technology (AU), Wright-Patterson AFB OH, September 1985 (AD-A162260).
- 4. Cheney, LTC William Fitch IV. <u>Strategic Implications of the Experience Curve Effect for Avionics Acquisitions by the Department of Defense</u>. PhD Dissertation. Purdue University, West LaFayette IN, August 1977 (AD-A046006).
- 5. Dews, Edmund and John Birkler. "Producing Small Quantities: Accepting a Way of Life?," <u>Aviation Week & Space Technology</u>, 11, 84 (October 24, 1983).
- 6. Draper, N.R. and H. Smith. <u>Applied Regression Analysis</u>. New York: John Wiley & Sons, 1981.
- 7. Gallant, A. R. "A Note on the Measurement of Cost/Quantity Relationships in the Aircraft Industry," American Statistical Association Journal, 1247-1252 (December 1968).
- 8. ----. "Nonlinear Regression," The American Statistician, 29: 73-81 (May 1975).
- 9. Gould, J. P. and C. E. Ferguson. <u>Microeconomic Theory</u> (Fifth Edition). Homewood IL: Irwin, 1980.
- 10. Murphy, Richard L., Assistant Professor of Quantitative Management Techniques. Personal Interviews. Air Force Institute of Technology, Wright-Patterson AFB OH, 19 June 1989 through 23 August 1989.
- 11. Neeley, Parley S. <u>Regression Analysis for Learning Curves</u>, Defense Logistics Studies Information Exchange, Fort Lee VA, April 6, 1983 (LD-57216HA).
- 12. Neter, John and others. <u>Applied Linear Regression Models</u>. Homewood IL: Irwin, 1983.

- 13. SAS User's Guide: Statistics (1982 Edition). North Carolina: SAS Institute Incorporated, 1982.
- 14. The Analytic Sciences Corporation. <u>Development of an AFSC</u>

 <u>Production Rate Variations Model Volume One: Executive Summary.</u>

 Report TR-4612-2-2. Air Force Systems Command (AFSC), Andrews AFB DC, October 1984.
- 15. The Analytic Sciences Corporation. <u>Development of an AFSC Production Rate Variations Model Volume Four: Data Handbook</u>.

 Report TR-4612-2-2. Air Force Systems Command (AFSC), Andrews AFB DC, October 1984.
- 16. Womer, Norman K. and Thomas R. Gulledge Jr. "A Dynamic Cost Function for an Airframe Production Program," <u>Engineering Costs and Production Economics</u>, 7: 213-227 (1983).
- 17. Wright, T. P. "Factors Affecting the Cost of Airplanes," <u>Journal of the Aeronautical Sciences</u>, 3: 122-128 (February 1936).
- 18. Yelle, Lewis E. "The Learning Curve: Historical Review and Comprehensive Survey," <u>Decision Sciences</u>, 10: 302-327 (1979).

VITA

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The purpose of this study was to refine the Air Force Systems
Command (AFSC) Production Rate Model that was developed in 1984 by The
Analytic Sciences Corporation (TASC). In 1985, under an AFSC sponsored
thesis, USAF Captain Hugh Bolton addressed various shortcomings in the
TASC formulation. Bolton also investigated two alternative formulations
and discovered that both models provided better estimates overall than
the basic learning curve model and the TASC formulation. Further
evaluation of the characteristics of these two alternatives was,
however, beyond the scope of his research.

The current effort analyzed several modifications to Bolton's
original alternatives in an effort to derive better results. To
accomplish this, four research objectives were established.

The first objective was to develop alternative formulations by expanding and/or altering TASC's and Bolton's formulations. These models should preserve the logic of the original formulations.

The second objective was to compare the results between TASC'S and Bolton's model formulations and the new alternative model formulations to determine which alternatives performed better and under what circumstances.

- The third objective was: (1) to investigate if statistical relationships exist for individual variables, (2) to determine which variables appear significant for different weapon systems; and (3) to identify any patterns that may exist in the occurrence of those variables.

The research was successful in evaluating these objectives. The modified formulations developed in this research effort outperformed the existing TASC and Bolton formulations. It was recommended that AFSC incorporate the new modified formulations into its Production Rate Model. Deoport systems; Industrial production rates; Cost regression analysis, Cost estimates, Theses. (EDC)